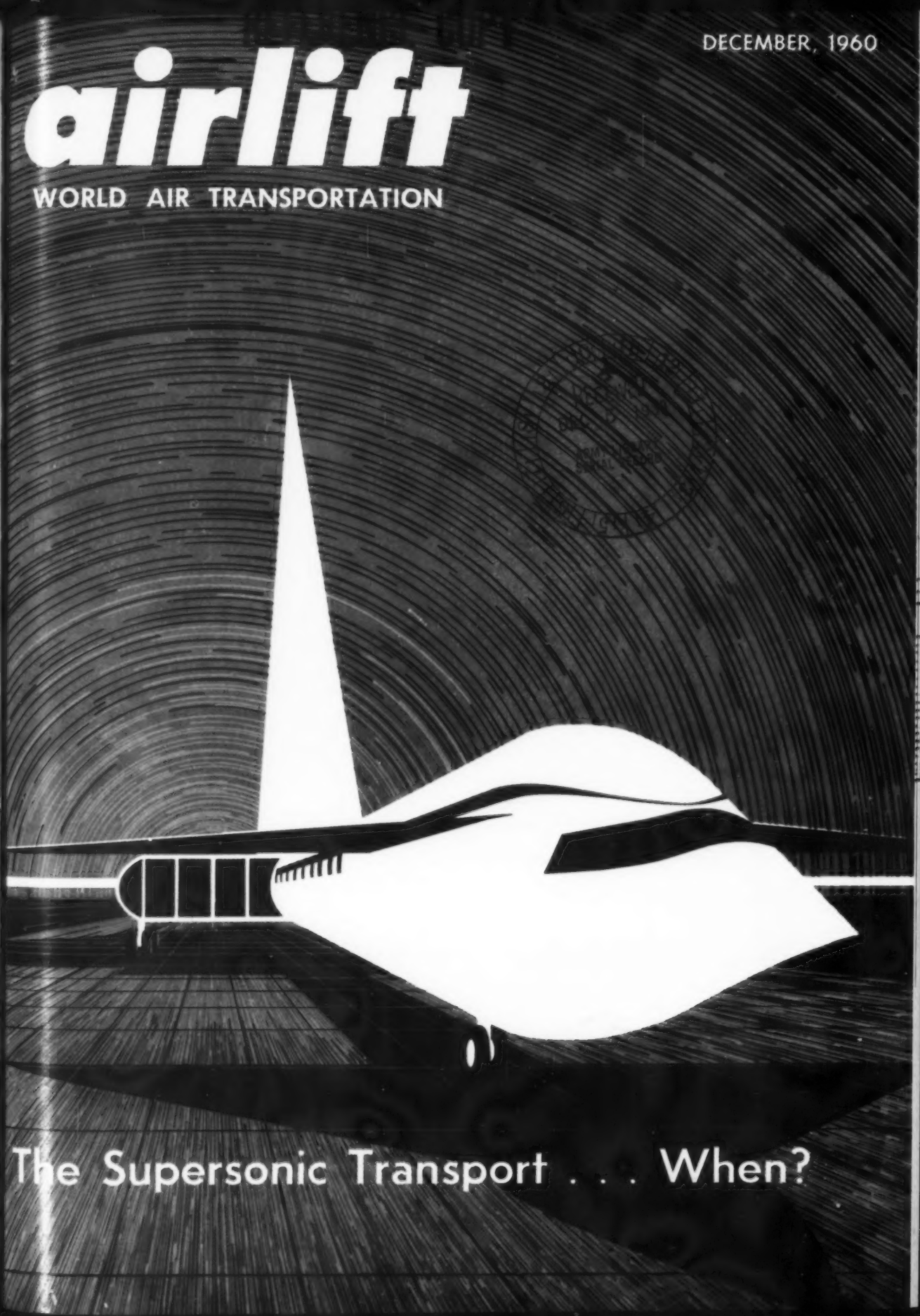
DECEMBER, 1960

airlift

WORLD AIR TRANSPORTATION



The Supersonic Transport . . . When?

Jack C. Keeler, Pueblo's Director of Aviation since 1945—licensed pilot and a past Director of Amer. Assoc. of Airport Execs.

Pueblo...a Preferred Stop for Rocky Mountain Fliers

The Memorial Airport for the City of Pueblo, Colorado . . . complete and up-to-date facilities, just five miles east of town.

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Air Force—B-58 Supersonic bomber · F-105D fighter-bomber · T-39 trainer

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PAUL J. McCARTHY

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DECEMBER, 1960—VOL. 24, NO. 7

airlift

WORLD AIR TRANSPORTATION

THE INDUSTRY IN BRIEF

Air Transport Trends 15
Industry at a Glance 17, 19

SPECIAL REPORT

The Commercial SST . . . When? 21

FEATURES

Coach Dominates Canada's Fare Plan 23
FAA's Third New ARTC Center Opens at Atlanta 24
An AIRLIFT Electronics/Photo Feature
Six Newcomers Vie for Air Taxi Market 26
States Abandoning Fuel Taxes 28
Sabena 'Copters Paying Off 29
Is Local Subsidy Here to Stay? 32
Bonanza Starts All-Turbine Operations 33

ENGINEERING/OPERATIONS

Growth Stressed in Air Data Design 39
FAA Nearing Flight Stage With Jet for Navaid Checks 43

ELECTRONICS/ATC

Tests Uphold 'Area Control' Concept 45

PURCHASING/STORES

Spares Pools Trim Inventory Costs 48

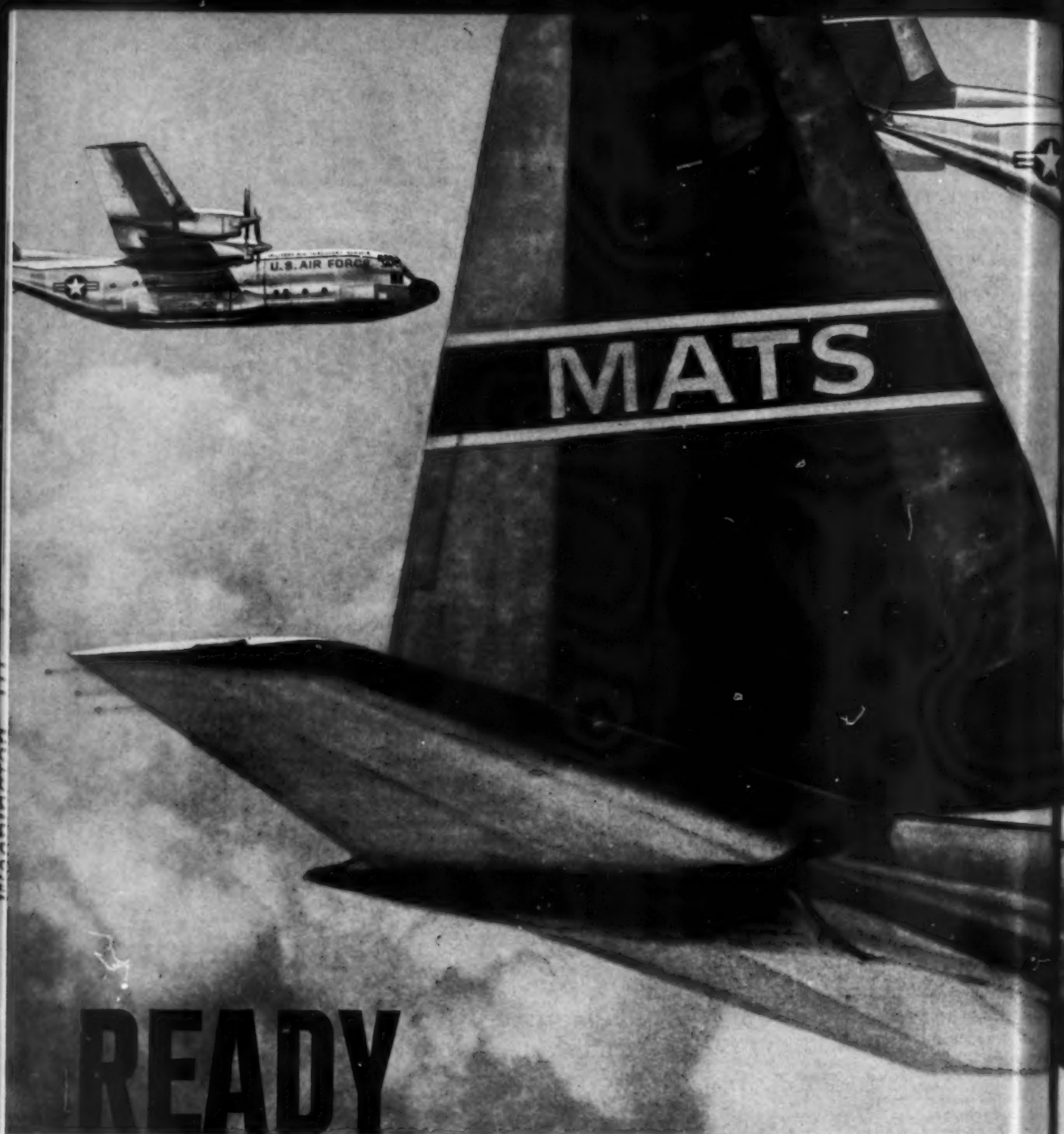
MAINTENANCE

Jets Foster New Overhaul Thinking 53

DEPARTMENTS

Personal View ... 9
Letters 10
1961 Calendar ... 13
Technically Speaking 34
On-Time Boxscore 36
How's Traffic ... 37
September Traffic . 37
About People 50
Airlifts 50
London Letter ... 51
Pilot Talk 52
Equipment World 54
En Route 58

THIS MONTH'S COVER—Kicking off an extensive series on the design, certification, cost, economics, market and operating problems of the commercial supersonic transport is West Coast Editor Bill Coughlin's report on "The Commercial SST . . . When?" (p. 21). Also vital to the SST issue are comments by American Airlines' Bill Littlewood (p. 10) and Michael Donne's "London Letter" (p. 51).



READY FOR USAF

The Military Air Transport Service will get the new extended-range C-130E Hercules fast, because the basic design is already proved. The long-range Hercules goes into production at once to meet the immediate need for a modern strategic airlift force.

The new long-range version of the versatile Lockheed C-130 Hercules gives the Air Force a strategic airlifter that can carry a 20,000 pound payload for more than 4,000 miles at average speeds up to 300 knots. Or 2,900 miles with a whopping 35,000 pound cargo. The big propjet C-130E meets these requirements for airlift operation: straight-in end loading; truck-bed height cargo floor; air-conditioned, pressurized cargo compartment; and the ability to lift, land, or airdrop heavy, bulky pieces of freight.

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GM JET POWER

Get Off the Defense

OVER AND ABOVE the structural circumstances resulting in two fatal accidents, the Lockheed Electra has had a streak of plain bad luck without parallel in the business. The effect of these twin developments has been to put all too many airline people on the defensive.

We are pleased to see several carriers—notably American, Eastern and National—take the offensive in pleading the righteous cause of what is basically a fine airplane. American's "Electra Fact Team" comprised of pilots and unassailably authoritative Bill Littlewood, vice president of equipment research, is an excellent example of sound public relations. National's advertising of Capt. Don Roper, a 19-year veteran, endorsing the Electra as his favorite airplane, is convincing.

With Electras flying 676 flights and 325,000 plane miles every day throughout the world, and with a vast reservoir of technical talent on the record supporting the Electra as a safe airplane operating under present reduced speeds, this is no time for any airline to take a defeatist attitude. As long as the Electra is backed up solidly by pilots and engineers, there is only one answer—go out and sell the airplane. Get off the defensive. And that goes, too, for Lockheed itself where the technical side of management has taken a strangely hang-dog attitude in an area which needs the highest sort of public relations direction.

Baggage Relief at Last

IN ADDITION to the newsworthy 25% reduction in fares which Trans-Canada and Canadian Pacific will put into effect January 2, the two carriers ought to get some sort of international award for what they will do about baggage.

The new economy class passenger on the two Canadian carriers will have a free baggage allowance of 44 pounds, up from 40. And at long last the first class passenger gets a break he has long deserved as part of his fare differential—he will get an allowance of 66 pounds, up from 40.

We have heard an awful lot of reasons from airline sales and traffic executives as to why a first class passenger in the U.S. on a transcontinental trip should not have more than the standard 40 pounds of free baggage, the same amount given to coach passengers. But we've never heard a reason that made sense to us. We suspect that TCA and CPA will start a trend that should have begun in the U.S.

A Jet-Powered First

TO A LOCAL CARRIER in the U.S. goes the distinction of being the first all jet-powered airline in North America and perhaps in the world. As of November first, Bonanza Air Lines has been operating turboprop F-27s exclusively over its system in California, Arizona, Nevada and Utah.

It is not only a mark of progress. It is also a strong indication that local carriers are eliminating small DC-3 stops which, after suitable experimental periods, have shown that they cannot support scheduled air service even with DC-3s without unduly burdensome subsidy. Cities which can support scheduled service can also provide better airports which in turn bring faster, better and more modern equipment.

Bonanza had small beginnings within Nevada. Much of the territory it serves is sparsely settled. But through the years it has obtained strong anchors in such major trading areas as Salt Lake City, Phoenix, Reno and Los Angeles, with its headquarters, Las Vegas, as the hub. In now operates a regional system which merits respect. We add our congratulations to the many it has received for reaching the jet-powered milestone.

Where Are They?

IN THE CENTURY of railroad development in the United States the depot or station was the center of transportation for every community. It was the hub of business activity, the center for hotels, the place everyone knew.

Would that airports, the new centers of passenger transportation, were as well known and identified! Local people generally know where the airport is located and how to get there, but for the non-resident who is driving in from a distance or who is using a rental car, it is often hell on wheels to find the airport.

State aviation officials and airport managers could perform a real service by getting city and county governments, and especially the state highway commissions, to provide adequate markings from *all* directions. Airports are becoming real city complexes in themselves. They need better identity. In traveling around we've had to find airports by hit and miss, airports doing lots of business but with only a few occasional small signs to indicate where they are. There's a busy airport, Shenandoah Valley, serving three communities in Virginia, so poorly marked that it's a real test of endurance to find it. Here's a job for those who should be alert to selling good facilities to the public.

Wayne W. Parrish

LETTERS

Pilot Pay Rebuttal

To the Editor:

Your recent pilot pay article was interesting and highly detailed; surely a "must-read" item for airline managers. Probably a similar indictment could be made for doctors, lawyers, dentists or even senior editors; though it would suffer for lack of the tabulations and charts you employed.

That present contracts between the various airlines and their pilots, as represented by ALPA, reflect the credit rigs you viewed as immoral or improper, demonstrates the pilots' experience with "best-effort" from the various companies to perform certain agreed, but ill-defined, working conditions.

Experience being the best teacher, these pilots, organized under ALPA but negotiating their own contracts, have seen fit to define by contract the factors that shape their lives. Where there is little or no abuse there is little demand to spend the time and money necessary to effectuate a contracting agreement. Where there is a demonstrable need for correcting an iniquitous situation, both time and money are spent in achieving an understanding with their employer.

All that the contracts represent are those areas (excepting pay) wherein an assumption of certain factors by the employing airline conflicted with normal working conditions elsewhere or sociologically accepted prerequisites of working conditions.

In the matter of pay: the airline pilot is like any other gainfully employed individual, he wants remuneration worthy of his calling. In addition, he feels entitled to certain working conditions, these conditions rarely being out of context with the times.

Proportionately to his productivity increase, his income has increased at a much lower rate. While the 707 is 267% more productive than the DC-7C, the pay proportion is on the order of 130%. Pegged speeds, gross weight pay, day/night pay, etc. merely reflect the complexity of trying to evolve adequate compensation.

The airline pilot faces new demands with each succeeding airliner, higher approach speeds, more exacting flight techniques, greater complexity of equipment and less room or time for error. Surely he is worthy of his hire, if his skills tend to diminish the risk and increase the reliability of schedules of his employer. Would you have a man worried about his income, his future and his status in society steering the large hunk of machinery that was tied to your tail?

CURTIS M. OLSEN
Pan American World Airways
London

The Pilot Issue

To the Editor:

I am a co-pilot for Eastern Air Lines and, before that, for Colonial Air Lines. I naturally read most of your articles concerning air transportation.

In the past few years I have been saddened by things written about pilots.

Continued on next page

Two Views of the Supersonic Transport

AIRLIFT received the following press release concerning the supersonic transport and outlining the views of C. O. Turner, general manager and chief executive of QANTAS, on the aircraft which he expects his company to be operating in the 1970s:

It will be a "Buck Rogers type" machine capable of 2,000 miles an hour at altitudes of up to 70,000 feet. Passengers will breakfast in Sydney and lunch in London the same day—12,500 miles in 10 hours.

The supersonic airliner will have these characteristics:

- Shape: torpedo-like, stainless steel with delta-wings at the rear.
- Size: 150 feet in length capable of accommodating 80 to 90 passengers in a long corridor cabin with a diameter of about 12 feet—much the same as today's jets.
- No windows: due to pressure and heat friction.
- Construction: steel and titanium.
- Television: through which passengers may view the country below or perhaps commercial programs.

Mr. Turner is emphatic that this is "not Buck Rogers type dreaming. The military supersonic bomber—the Hustler—is already an accomplished fact, developing speeds of over 1,500 mph. It is simply a matter of waiting for the planes to be built.

"We know they are practical. We are already studying how we will use them on our longer routes. They would be particularly suitable for long over-water flights."

Mr. Turner feels confident that passengers will soon become accustomed to travel in supersonic aircraft, and believes QANTAS will buy four to five of these aircraft. Four would probably do the work of a dozen or more conventional aircraft.

"Our projection is that they will be a commercial proposition, with fares at about the same level as at present," he said.

To see how a U. S. airline official would regard Mr. Turner's concept of the SST, the release was in turn sent to William Littlewood, v.p. for equipment research at American Airlines. His reply follows.

I suspect this is a news release from the Public Relations Department rather than direct quotations from Mr. C. O. Turner, General Manager and Chief Executive of Qantas, since others have advised me that Mr. Turner is quite conservative by nature and has not indicated in other comments the definitive opinions concerning supersonic flight attributed to him in this document.

The supersonic transport which the release delineates is amazingly like a scaled down B-70, which seems to be the inevitable fate of all hastily conceived forecasts in this field. As one of our learned engineers said recently, the reasons our modern jets all look so much alike are (1) they were designed to the same airline specifications, (2) they were designed from the same basic NASA data.

Many people apparently are looking into the crystal ball which has now turned in the direction of supersonic transports and, as a result, they all come out looking alike. The increasing probability seems to be that technical developments now under way will result in a supersonic transport one day which may be quite different in configuration from the B-70 and will be much better suited to the overall problem and its relation to airports and passengers.

I am puzzled by the thought that our supersonic transport should have no windows. We have apparently forgotten a psychological medical phenomenon known as claustrophobia, which I find from time to time affects passengers in normal air transports with quite adequate window provisions.

We have forgotten also that supersonic transports will occasionally spend quite a lot of time in the lower turbulent regions of the atmosphere and may well encounter turbulence at higher altitudes when the lack of ability to look out windows would be distressing even to passengers not suffering from claustrophobia. The technical problems of providing windows are apparent but are only one of literally hundreds of technical problems which have not yet been solved in connection with Mach 3 supersonic flight.

People who have dealt with the airline passenger for years are quite impressed, I think, with the fact that the average passenger insists on being treated throughout his flight as a normal human being. He will not willingly get into a "g" suit, he will not willingly have his windows closed off, he will not endure excessive attitudes of the airplane, he quite insists on getting aboard in an ordinary business suit with a brief case and sitting in a comfortable seat in a well ventilated salon with a good view outside and hopefully being served perhaps a martini and certainly a good meal.

Any other concept seems highly unrealistic and not consistent with any wide use of a vehicle which is less acceptable. Nevertheless with vague definition people seem to consider that many people will ride such undesirable types of machine.

The release very properly refers to the concept as a "Buck Rogers type." The release is full of numerical contradictions—a machine capable of 2,000 mph which will then only average 1,250 mph in 12,500 miles seems hardly consistent. Also, the use of television to see the ground below: what it will show from 70,000 feet is a very strange concept.

I think it might be more desirable, if you are not going to have any windows, to paint seascapes and snow-cap mountains instead of the windows, which might be quite enjoyable to contemplate.

One minor contradiction in the release, and I quote referring to Mr. Turner. He forecasts a "Buck Rogers type machine," later, "Mr. Turner is emphatic that this is not Buck Rogers type dreaming." There must have been two writers of this news release!

I will certainly agree with the statement "It is simply a matter of waiting for the planes to be built." The only question is how long and after how much research and development before we have the type of supersonic aircraft which is economically feasible and which is the kind of machine conservative transport operators would wish to submit with confidence to the traveling public.

WILLIAM LITTLEWOOD
v. p., Equipment Research
American Airlines

Some of these things, I admit to myself, were true. Very few were completely untrue. But it was the way they were slanted that bothered me.

For example, an article from the Sept. *AIRLIFT* is headlined, "FAA's Big Weak Spot Starts to Show." This article basically states that maintenance people and engineering personnel of airlines and manufacturers know better through day to day experience the dependability of their product and the type of maintenance it needs. A United Air Lines official questions whether FAA is properly evaluating what is appropriate for development of air commerce, as well as what is necessary for air safety.

By substituting a few words this is the pilot argument. Who knows more than the men who day to day fly the route how this can be done safely?

Another quote: "There has been an increasing tendency for FAA to delve deeply into how each air line performs its work instead of evaluating the end result." Again this goes for pilots. This article also states that it appears FAA has already made up its mind before it holds a meeting with airlines. If you read over this article you will see many parallels to what the pilots have been saying.

In the same issue is a story about pilot pay. The pilot only works 12 days a month. I could tell my five-day-a-week neighbor he only works seven days a month if I added his pay hours and divided by 24, but he would know better. It's the way it is slanted. I know the pay scale indicated is possible, but it is seldom realized and certainly not by me.

I now ask if you do not believe at least some of your stories on pilots are slanted and maybe their arguments have some merit.

VERNE J. RENAUD
Co-pilot
Eastern Air Lines

Service Around the Globe

To the Editor:

Your difficulties in shipping a mandir from Nepal to Washington (*AIRLIFT*, July) aroused my sympathy, and I'd like to point out a way to overcome such difficulties in the future.

Many of us overlook an organization which has been quietly performing thousands of functions for travelers for 120 years. It is similar to American Express, and indeed cooperates extensively in friendly fashion, but it is larger and perhaps more erudite.

I refer, of course, to the 13,000-man, world-wide network of Thos. Cook & Son.

Cook's does the unusual. For example, a gentleman wanted his personal .45 caliber Colt sent across Asia to Paris, an operation almost as difficult as your mandir movement. A Cook's courier strapped it on and delivered it promptly. If I recall, the charge was about $6.00 and the gentleman wrote a marvelous letter to Cook's.

Another "shipment" consisted of a family's five teenage daughters making a journey that required crossing nine Asian-African countries, several of them primitive. Passed along by four Cook's escort-couriers, the girls arrived on time and in good health. Also allegedly intact.

If you have difficulties in the Far East again, Cook's has many offices there, Ceylon, Malaya, Hong Kong, etc. In Bombay, you'll find Cook's offices in the Taj Mahal Hotel and D. Naoroji Road. In Washington, your own Cook's official, Jerry Powers, in the office at 812 Fifteenth St., N.W., can do almost anything for you.

Those of us who bounce around the world a lot sooner or later come to rely on this efficient organization. Its members are helpful, informed, and reasonable. Perhaps your readers would appreciate this reminder.

WILLIAM L. ROHDE
Cunningham and Walsh
New York

Rooter for MATS

To the Editor:

Your editorial in the October 1960 issue on MATS is most timely. It was difficult going in the Congo, taking five days for the 10,000 mile round trip, plowing along through the weather over the jungle when jets were making a similar run in little more than one day—certainly a dramatic contrast in the evolving technology of flight.

Your support for modernization of the MATS strategic airlift force is most appreciated.

RAYMOND L. TOWNE
Lt. Col., USAF
Scott Air Force Base

A Philosophy for Locals

To the Editor:

It would seem very beneficial to the growth of the nation's transportation system if our planners would pause—between thinking of sst's, swing tail freighters, manned rockets to the moon, et al—to consider the crying need for a local service transport.

The need for an aircraft that would carry loads over short (50 to 80 mile) stage lengths, profitably, has been with us since the locals started operation in 1946. It is inconceivable that America's aviation leaders and planners have not been able to get together to solve this problem.

We find the ink is hardly dry on a local's route award before the management is figuring ways to overfly or eliminate unprofitable stops. This is understandable, if management's primary concern must be to make a profit. Ideally, this concern should be to provide air service to the particular area of operations in such a manner that air travel increases, industry locates at the cities with scheduled air service, and the nation as well as the communities grow and benefit from the taxpayers' investment in local airline subsidy. The question should be whether the locals are doing their job, rather than when will they get off subsidy.

When one considers the world market in 1961-1965 for a true local service transport, it must be realized that sufficient numbers of the transport would be produced to warrant manufacture. If a por-

COMING

December, 1960

Dec. 5-8—National Aviation Trades Assn., 21st annual convention, Biltmore Hotel, Okla. City.

Dec. 5-8—ATA, reservation procedures subcommittee meeting, ATC conference room, Wash., D.C.

Dec. 7—ATA, board of directors meeting, ATA conference room, Wash., D.C.

Dec. 8—ATA, membership meeting, Federal Room, Statler-Hilton Hotel, Wash., D.C.

Dec. 16—National Aeronautical Services Assn., army aviation contract services symposium, Mayflower Hotel, Wash., D.C.

Dec. 16—Aviation/Space Writers Assn., 5th convertible aircraft conference, National Academy of Science Auditorium, Wash., D.C.

Dec. 17—IAS, Wright Brothers Lecture, Natural History Bldg., Smithsonian Institution, Wash., D.C.

Dec. 17—Wright Brothers Memorial Dinner, Sheraton-Park Hotel, Wash., D.C.

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Top Events of 1961

January

Jan. 9—AAAE, board of directors meeting, Tucson, Arizona.
Jan. 9-11—Airlines Electronic Engineering Committee, general meeting, Hotel Roosevelt, New Orleans.
Jan. 15-18—Helicopter Assn. of America, annual meeting, Cherry Hill Inn, Haddonfield, New Jersey.
Jan. 23—IATA, cargo conference, London.
Jan. 23—ALTA, fourth annual congressional appreciation lunch, Washington Hotel, Wash., D.C.
Jan. 23-24—ALTA, annual meeting, National Aviation Club, Wash., D.C.
Jan. 23-25—IAS, 29th annual meeting, Hotel Astor, New York City.
Jan. 31-Feb. 1—Airport Operators Council, board of directors meeting, Wash., D.C.

February

Feb. 13—IATA, medical committee, New Delhi.

March

Mar. 12-16—ASME, aviation conference, Statler Hilton Hotel, Los Angeles.
Mar. 16-18—National Aviation Education Council, 5th national conference on aviation education, Mayflower Hotel, Wash., D.C.
Mar. 20-23—IRE, international convention, New York City.

April

Apr. 4-7—SAE, national aeronautic meeting, Commodore Hotel, New York.
Apr. 17—International Airport Assn. 14th technical conference, Queen Elizabeth Hotel, Montreal.
Apr. 18—IATA, legal committee, Paris.
Apr. 18-20—Airlines Electronic Engineering Committee, maintenance meeting, Drinkler-Plaza Hotel, Atlanta.
Apr. 22-25—AAAE, annual conference, Colorado Springs, Colorado.
Apr. 24-27—Aerospace Medical Assn., 32nd annual meeting, Palmer House, Chicago.
Apr. 26—IATA, technical committee, Montreal.

May

May 7-12—Airport Operators Council, annual membership meeting, Carillon Hotel, Miami Beach.
May 8-10—IRE, national aeronautical electronics conference, Miami & Dayton Biltmore Hotels, Dayton.
May 17—IATA, financial committee, Montreal.
May 26-Jun. 4—International Air Show, Paris.
May 31—IATA, executive committee, New York.

June

Jun. 2-3—Reading Aviation Service, 12th national maintenance and operations meeting, Municipal Airport, Reading, Pa.
Jun. 3-5—Aviation Distributors & Mfrs. Assn., 37th meeting, Dennis Hotel, Atlantic City.
Jun. 13-16—IAS, summer meeting, Los Angeles.
Jun.—Airlines Electronic Engineering Committee, general meeting, Hotel Saxony, Miami Beach.

August

Aug. 1-2—Airport Operators Council, board of directors meeting, Wash., D.C.

September

Sept. 8-10—Society of British Aircraft Constructors, annual equipment exhibit, Farnborough, England.
Sept. 12-14—National Assn. of State Aviation Officials, Deauville Hotel, Miami Beach.
Sept. 26-28—National Business Aircraft Assn., 14th annual meeting, Mayo Hotel, Tulsa, Okla.

October

Oct. 3-5—AAAE, national airport conference, Norman, Okla.
Oct. 9-11—Airport Operators Council, mid-year membership conference, El Paso, Texas.
Oct.—ATA, engineering and maintenance conference, Miami Beach.
Oct. 9-13—SAE, national aeronautic meeting, Ambassador Hotel, Los Angeles.
Oct. 19—IATA, executive committee, Sydney, Australia.
Oct. 23—IATA, 17th annual general meeting, Sydney, Australia.
Oct. 23-25—IRE, east coast conference on aeronautical & navigational electronics, Lord Baltimore Hotel, Baltimore, Md.
Oct. 30-Nov. 1—Air Traffic Control Assn., annual meeting, Deauville Hotel, Miami Beach.

November

Nov. 28-30—Aviation Distributors & Mfrs. Assn., 38th annual meeting, Jung Hotel, New Orleans.

December

Dec. 6-8—National Air Taxi Conf., annual meeting, Biltmore Hotel, Okla. City.
Dec. 18—IAS, Wright Memorial Lecture & Dinner, Wash., D.C.

tion of the local's subsidy had been directed toward design and manufacture, we would be operating the aircraft today.

The design concept of the local service aircraft should include the following philosophy:

1. Operate from short fields with slow approach and landing speeds to enable operators to obtain the lowest possible IFR minimums, serve the maximum number of communities, and reduce taxi time.

2. Operate with minimum ramp time, ramp equipment, and ramp personnel. Ramp level loading, ample carry-on baggage space, center point refueling, cargo pod units that can be preloaded before aircraft arrival.

3. Operate economically over short stage lengths. Interchangeable piston-turboprop engines appear the best answer today on a mixed fleet basis.

4. Provide sufficient passenger seating to permit commuter ticketing, thereby reducing reservations cost.

Rest assured, the problem of the local service transport is not going to resolve itself, nor have foreign aircraft provided the answer. America has the aviation know-how to design and produce an aircraft that will serve the local communities.

Let us hope our aviation leadership will provide this aircraft with which we can effectively serve *all* communities in need of air service.

W. K. Howell
Local Service Captain
Detroit

An Argosy Engineer?

To the Editor:

Your September issue, under Air Transport Trends, sub-topic FAA, contains material unwarrantedly damaging to the flight engineering profession. It starts with the basic premise the flight engineer does not pay his own way and further ignores an additional FAA requirement that a flight engineer may be required on any aircraft over 80,000 pounds.

There are many of the civil air regulations that you might suggest be removed in the name of expediency to help such airlines as "Riddle" who are initiating the operation of a new aircraft.

I might suggest that the fire detection and extinguishing systems and the power plant instrumentation be omitted since it is felt in many circles that engine fires on jet engines are not potentially hazardous and that on jet engined aircraft you either go or don't go so you don't care too much how the power plants are operating. If you start with the premise that we don't need these systems then we could also suggest that FAA obviate the requirement for them.

You will find that the FAA has been following the changing needs of our industry closely. This has been done through annual airworthiness reviews and a continuous flow of civil airworthiness regulation changes. Instances of disinterest or inactivity by the FAA are few indeed.

Sometimes, in the interest of expediency, items which should be included in the requirements, i.e., fuel pressure gauges, are admittedly dropped. However, the FAA constantly reviews the performance of both equipment and personnel, does a respectable job of adjusting to current needs and still holds the flight engineer in very high esteem.

Some airlines and the ALPA call the flight engineer a "Second Officer," but it should be noted that the FAA and an overwhelming majority of long established major airlines all classify him properly as the "flight officer." He is basically the engineering and maintenance representative aboard his assigned aircraft.

I think it would be well for a magazine which is advertised as "designed for the air transport industry" to fairly present the picture as it exists—industry pattern shows acceptance and acknowledgment of value of the flight engineer for over 30 years all over the world.

Statements and wording in *AIRLIFT* indicate an uninformed and biased concept in regard to omission of a flight engineer from the cockpit crew. I sincerely urge you to conduct further investigation into the performance and operation of the many airlines who have utilized "qualified" career flight engineers for many years. Presentation of your findings would be a large step in the direction of providing a correct picture for your many readers of our situation in the air transport industry today. I am sure this really is your aim.

E. S. Kump
Santa Clara, California

Ed. note: *We take no issue with merits of flight engineers. Our trend simply pointed out that 80,000 lb. rule might require an engineer in the Argosy whereas its passenger-carrying equivalent, from the standpoint of powerplants, the Viscount, has no engineer.*

In Defense of Food Service

To the Editor:

Having had over 12,000 flight hours in cabin service, beginning with the "China Clipper" days, I would like to express my own viewpoint on the article, "Is The U.S. Losing the Battle of the Atlantic," in the July issue. My viewpoint is his fifth point, which is: service or the lack of it.

The blame for the lack of service, or the indifference should not wholly be placed upon the stewards, stewardesses and pursers.

Good service must have the element of proper attitude before it will generate. Why it isn't there in effect will be related to management. It is management's responsibility to obtain that attitude in its personnel.

How? First, reorganize the departmental charts, putting passenger service, traffic sales, operations, and maintenence in this order of importance. Have a qualified service man with the top executives paying, if necessary, $50,000 or more a year. Do not put in as directors of departments ex-captains, ex-traffic/sales, ex-operations personnel and ex-maintenance, but select persons whose field is service.

Second, do not try to duplicate in form the continental method of service. This is admitting that it is superior to ours. Food and service now are the main points for comparing airlines. I fully believe that the American style of service can compete with wonderful menus, instead of exquisite ones; personnel with the proper attitude, believing in our methods, not underestimating ourselves or the quality of food that we can produce. We should put an American label on our style; be copied but do not copy.

Third, but not least, instill into every employe, flight and ground, this important item: "THE CUSTOMER PAYS OUR RENT."

Tom Moffatt
Nationwide Food Service Inc.
Chicago

Mohawk's CVs Were Planned

To the Editor:

Mohawk's fleet of CV240s and 440s was not acquired as a DC-3 replacement nor as interim equipment. In 1952 an independent study demonstrated the need for larger, faster, post war equipment to handle Mohawk's expanding routes and increasing loads. This study confirmed Mohawk's management decision that the CV was the answer. In 1955 CVs were introduced into service on our routes.

A study was again made in 1956. No so-called DC-3 replacement could have filled our requirements. Our needs were beyond any equipment of that size and speed. We see no more need to replace the DC-3 than does Ford the Model T.

Mohawk's five 440 CVs were certainly not hand-me-downs. They were bought off the production line and were brand new equipment. They were bought after thorough analysis and study of all turboprop equipment then and now available and are, in our opinion, the best suited of any available aircraft to Mohawk routes today.

ROBERT E. PEACH
President
Mohawk Airlines

BOOKS

The Crowded Sky, Hank Searles; Harper & Bros. 49 E. 33rd St., New York, N.Y.; 274 pages; $3.95. Naval aviation veteran Hank Searls has made a provocative study of an all-too-possible airways "conflict" in today's control system. He also has drawn a couple of memorable aviation characters—notably the father-image, second-senior pilot-in-command who is so habit-ridden he's "not quite safe" (and NOT because he's over 60), and the air traffic controller whose intuitive mastery of his board almost enables him to make a miraculous save.

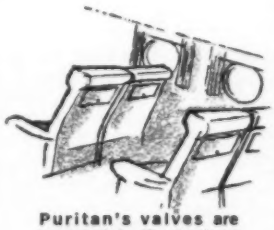
One top ATC expert calls this the best fiction treatment of traffic control he's ever seen. For those not so technically-minded, Searls' flashback technique hones his story's suspense to a fine edge. This makes it a natural for Warner Brothers' movie script writers, who, according to first reports, have managed to demolish Searls' careful ATC study and scare the seatbelts off all but the veteran air traveler.

This Was Air Travel; Henry R. Palmer, Jr.; Superior Publishing Co., Seattle. A pictorial chronicle of air transport from 19th century balloons to modern jets. Palmer's knowledgeable reflections on the growth of the industry are incidental to flock of photographs showing every transport aircraft developed from Wright's embryo pusher to the DC-8.

Control Tower and Dispatcher Ratings, Third Ed., Charles A. Zweng; Pan American Navigation Service, 12021 Ventura Blvd., North Hollywood, Calif.; $5.00. This manual is designed to prepare candidates for the FAA Aircraft Dispatcher or Control Tower Operator certificates. Contents include chapters on navigation, procedures, meteorology, radio aids, etc. plus sample examination questions.

Aviation Cartography, Walter W. Ristow; Map Division, Reference Dept., Library of Congress, Washington 25, D.C.; $1.75. This publication is divided into two parts, a 53-page history of aviation cartography and a 188-page bibliography of works dealing with maps, charts, radio aids, and other navigational implements.

Puritan Rides the Caravelle for United Airlines



Puritan's valves are mounted in the back of seats facing passengers, and in the Caravelle's bulkheads in both the lavatories, and where there are no seats forward of the passenger station.

Puritan's on-and-off valve, and first aid valve for passenger outlet stations have been specified by United Airlines for the oxygen breathing systems in their fleet of new Caravelle Jets, manufactured by Sud Aviation, Toulouse, France.

The Puritan valves enable passengers to be supplied with emergency oxygen if needed, and, during normal flights, with first aid oxygen for respiratory ailments.

Your inquiry on any problem concerning high altitude breathing systems and equipment would be welcome.

AEROSPACE DIVISION

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PROBLEMS? OR PROFITS?

Route pattern complexities of typical airlines demand a cargo aircraft with the capability of operating over both short and long route segments with excellent economy and earning ability. The Canadair Forty Four will do this for you! It combines the air cargo feeder liner with the long range aircraft to provide a standardized economic fleet unit. The Forty Four will give you profit-making operations, at current rates, over route segments as short as 200 miles and as long as 4,000 miles.

This is the type of flexibility that will answer the many and varied problems confronting airline operators who, because of the growing demands of shippers, are being forced to provide a combination of short, medium and long range air cargo services for the carriage of freight at attractive and competitive tariffs. In this situation, the Canadair Forty Four offers excellent economy and earning ability over the complete range of route structures that must be provided in the collection and distribution of air cargo.

Practical applications of this are found in the short route cargo services that are necessary in the supply and distribution of goods to or from the terminal points of transcontinental and trans-Atlantic services. This is evident between the major cities of the Eastern United States and between the principal points of Europe. These inter-city runs are essential extensions to the long haul trunk service, and with the Forty Four can be handled without a change of aircraft.

The need for this system of short, medium or long range operations will develop through the growing awareness among business establishments that the carriage of articles by air is becoming an essential element in the overall marketing function. This will open up new markets, new transportation requirements, new inter-city services. The Forty Four, with its flexibility of performance, can carry cargo at a profit over the whole distance spectrum—short, medium and long range, and has the airfield performance characteristics to get in and out of 85% of the world's major airports. THESE ARE DECISIVE ADVANTAGES IN FAVOR OF THE FORTY FOUR.

SOME RUNWAY AND PAYLOAD SPECIFICS ON THE FORTY FOUR-D4

1. From runways as short as 6,000 feet, can operate with 70% payload up to stage distances of 3,000 miles.
2. Can operate from 85% of the world's major airports, with due consideration to both runway length and allowable wheel loading.
3. Will earn an operating profit with load factors as low as 30%.
4. Breakeven load factors in the Forty Four represent loss loads on larger proposed equipment.
5. Breakeven load factors on larger proposed equipment represent major profit payloads on the Forty Four.
6. Can operate *non-stop* on the London-New York route with an average annual payload of over 55,000 lbs.

CANADAIR LIMITED, MONTREAL, CANADIAN SUBSIDIARY OF **GENERAL DYNAMICS**

AIR TRANSPORT TRENDS

Supplementals

Arctic-Pacific football team tragedy was a black eye for supplementals, one that these carriers won't soon live down. List of FAA charges which led to suspension and decision not to renew carrier's operating certificate is reminiscent of the "nonsked" era. Examples: one engine, an R2800-79, wasn't certificated for C-46; plane was being operated below weather minimums, overweight by 2000 lbs., with crew exceeding "on-duty" maximums. Two days before Oct. 29 accident, carrier posted letter to FAA saying pilot L. J. Chesher, commander of ill-fated flight, was no longer employed. Correspondence arrived at FAA two days after the accident.

Technical

Economics, ironically, are the big barrier to fan conversions. Despite better operating costs of turbofans, conversion price runs over $2 million per 707, more than 40% of initial cost of the jet.

Equipment

Lake Central won't convert Convairs to turbine power immediately. Company originally planned fast Allison conversion of five planes bought from United. Now, however, it has decided to move conservatively, make certain that traffic projections are sound. Forecast is that recent big route awards will jump commercial revenue from $3.5 million yearly to $9.9 million in year starting next July. LCA also plans to buy 10 more DC-3s.

Competition

Howard Hughes' haggling over TWA financing will hurt the airline. In jet equipment, it will lag far behind transcontinental competitors by end of 1961. American will have 65 jets, United 77. Even if financing is completed soon and TWA gets 20 Convair 880s, it will have only 47 jets to cover domestic and international routes. And delay means no order is placed for short/medium range aircraft.

Politics

Loan bill for cargo planes may be problem for airlines. Sen. Mike Monroney's proposal in last Congress providing government-guaranteed loans for purchase of modern all-cargo aircraft was opposed by most big airlines, although endorsed by FAA and CAB. If bill is reintroduced, touchy question is whether larger carriers can afford again to buck one of aviation's best friends on the Hill in order to keep smaller lines from getting loans.

ALPA

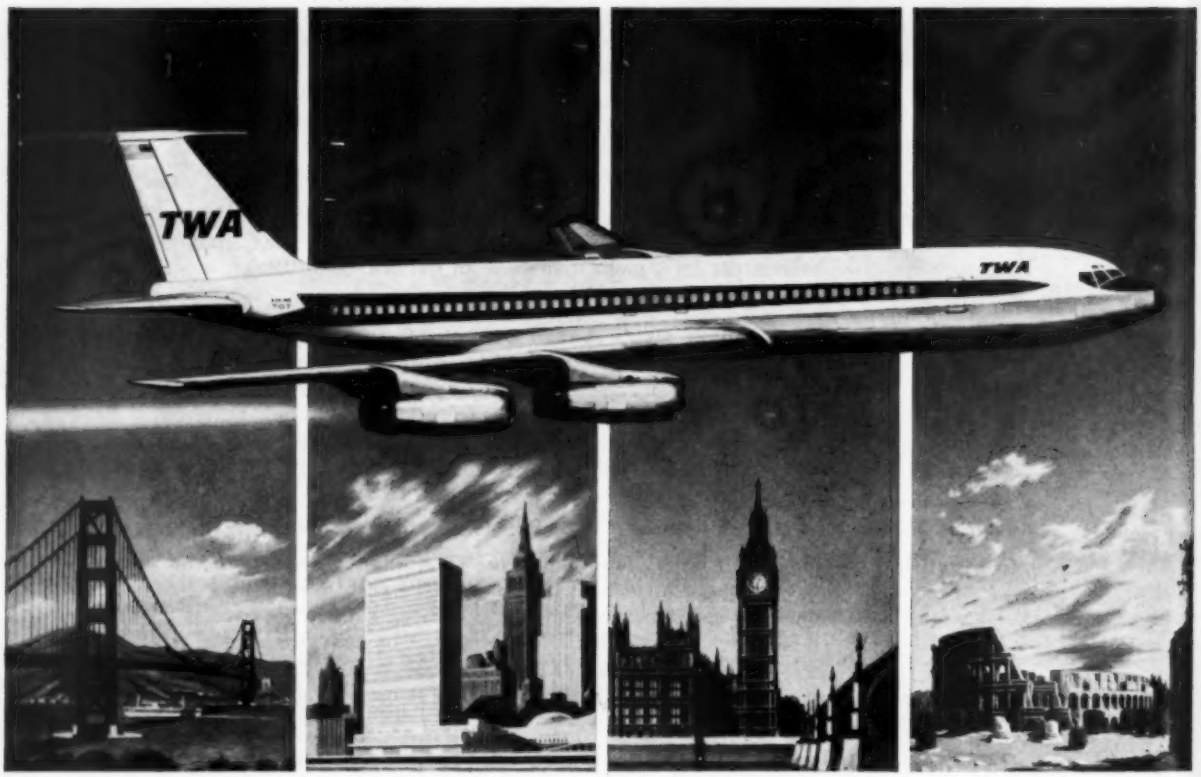
Pilot pay increases haven't slackened. Here's what recent ALPA convention was told: Airline pilots have not only maintained but have improved their position as the highest paid professional group in U.S. From 1957 to 1959, average income increased by $2,670 per pilot. This amounts to more than $37 million a year—exclusive of pensions and fringe benefits.

FAA

Policy breach with airlines on maintenance is narrowing. Outlook for improved industry/FAA relations is good, mostly due to realism injected into recent meetings by George C. Prill, new deputy to Oscar Bakke in flight standards branch.

TWA THE SuperJet AIRLINE

is the only airline flying across the United States...
across the Atlantic... across Europe ...and across Asia



TWA JETS now serve LOS ANGELES · PHILADELPHIA · KANSAS CITY · NEW YORK
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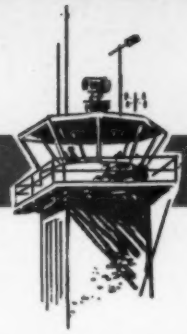
INDUSTRY AT A GLANCE



EQUIPMENT

New transport orders remain scarce, as financing becomes a major hurdle for airlines in build-up of turbine fleets. **Alaska Airlines** orders a single Convair 880M for spring '61 delivery. **Pakistan International Airlines** will order three long-range 707s or four 720s within the next six months. **Air France** will buy three more 707s, bringing its fleet to 20.

Recent orders by Air France, Alitalia, and Iberia have boosted Sud Aviation's Caravelle sales to 109, with the prospect of more to come.

Resales are slow, too. Alitalia buys five of the Capital Airlines Viscounts being returned to Vickers. Mohawk Airlines purchases two and options three other American Airlines 240s as part of its plan to retire the DC-3 in 1961.

Northeast gets its jets. First four of six Convair 880s will be in Northeast Airlines' hands for start of service December 15 under separate lease-purchase agreements arranged with Convair and engine builder, GE. NEA's will be the first 880s with coach seats, 65 tourist and 32 first-class. Delta's seat 84 first-class.

Two turbine lines shut down. England's Bristol Aircraft is closing down its turboprop Britannia line after building 85 aircraft valued at about $280 million, including spares. Company's Filton plant will continue customer service support . . . **Fairchild** is calling a halt to F-27 output, but expects that 16 "speculative" aircraft now built or in process will stretch production to October 1961.

POLITICS

Democratic administration means new faces, possibly new policies for air transport. Whitney Gillilland will be replaced as CAB chairman but remains as a member. E. R. Quesada, new owner of the Washington baseball team, leaves as FAA Administrator. Rumor mill is working overtime on replacements, but nothing definite yet.

In policy field, Kennedy looks to one-time CAB chairman James M. Landis for study of all regulatory agencies. Based on his past statements, Landis may favor some kind of a "ministry of transportation" to head up planning functions of agencies.

In Congress, look for a new federal aid airport bill (under Eisenhower, this is final year of federal aid). Increasing subsidy will be a problem; Congress is still concerned over rising costs.

Other items that may come up, and on which new administration's position isn't known: role of supplementals, guaranteed loans for purchase of modern cargo planes, increase in limit on present guaranteed loans to carriers, FAA safety rule-making, increased aviation fuel taxes, expansion of first-class mail by air, supersonic transport development, whether U.S. is giving away too many international air rights.

MANAGEMENT

End of an era at Seaboard. When Raymond and Arthur Norden, still in their 20s, were Air Transport Command officers in World War II, they foresaw a tremendous development of airfreight in the postwar period. In 1947, they dealt themselves a hand in the game by forming Seaboard & Western, eventually won a CAB certificate as the only scheduled U.S. international all-cargo line.

For several years S&W did well with commercial business, military contracts, equipment leases. The 1955 profit, for example, was $1.9 million, but the figure dropped to $485,273 in 1956. Ever since, S&W has been in the red. Loss of leases and military business hit hard, brought 1959's loss to $3.8 million.

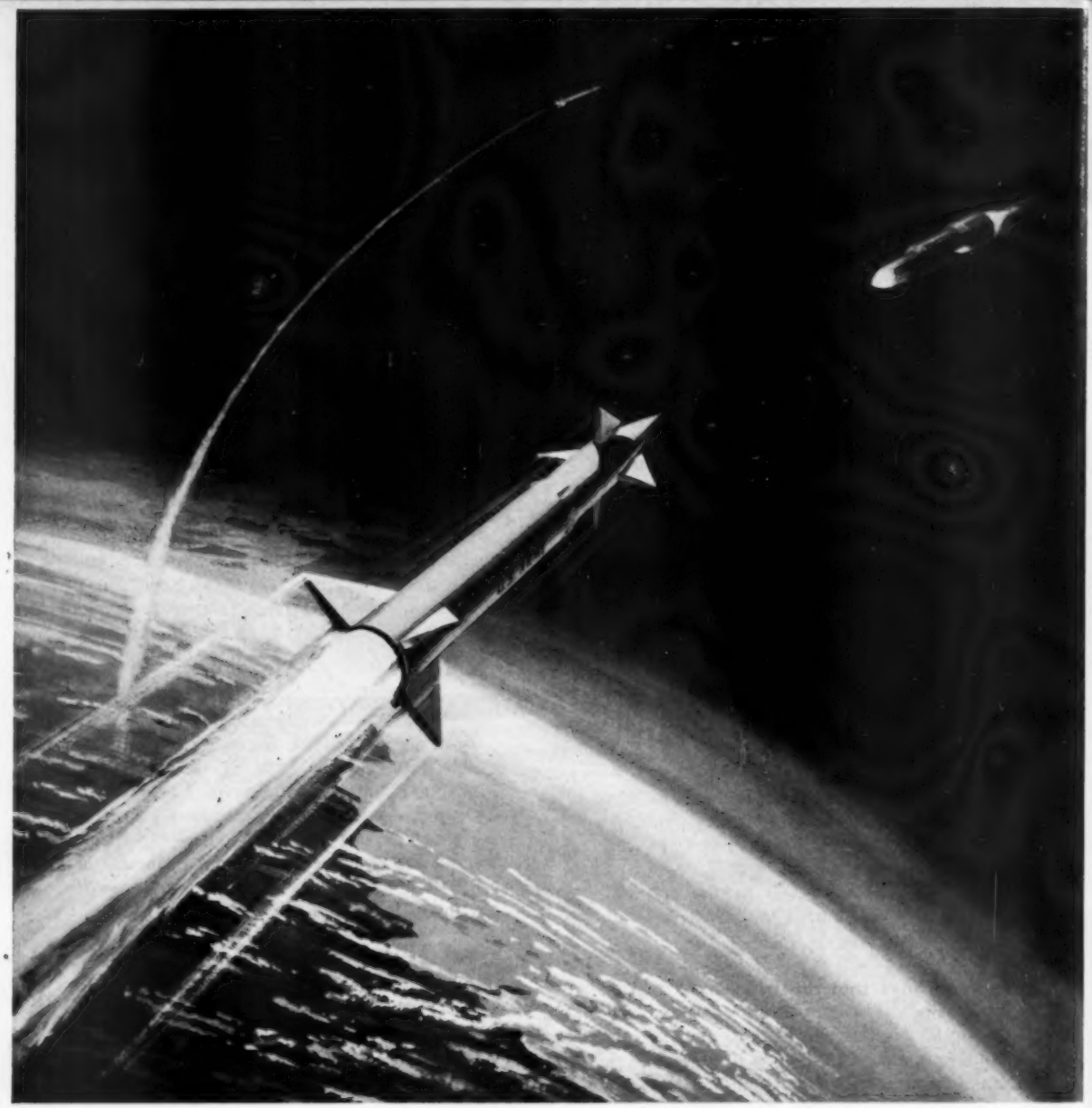
As red figures mounted this year, reorganization and refinancing became inevitable. Brought in as president and board chairman: Richard Jackson, former aviation adviser to Laurance Rockefeller. Moving out are president Ray Norden and executive v.p. Art Norden. The pioneering brothers' only connection with the company they founded will be as consultants.

LABOR

Sayen victory. In a late night session on the ninth day of the Miami convention, Air Line Pilots Assn. reelected C. N. Sayen as president.

Anti-Sayen pilots failed in attempts to nominate former CAB chairman James M. Landis. A non-pilot, he needed two-thirds vote, or 7692, for

Continued on page 19



With its tremendous thrust, *Zeus* can intercept attacking missiles far from the area it defends

Zeus is designed for a hit every time on supersonic bull's-eyes!

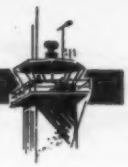
At best, an anti-missile defense will have only a few minutes to react ... and no "second barrel" to fire at its supersonic target.

Nike Zeus needs none. Tests of this new anti-missile missile show that it will attack enemy ICBM's with 100% accuracy at a distant interception point. There its nuclear warhead will be detonated to blanket the approaching ICBM with an explosive curtain.

The newest member of the famous Douglas *Nike* family, *Zeus* was developed in a joint Western Electric, Bell Telephone, Douglas Aircraft project. Its design combines the most successful lessons learned from *Ajax* and *Hercules*—*Nike Zeus* predecessors that are on duty around many important U. S. cities and industrial centers and with NATO forces overseas.

DOUGLAS

MISSILE AND SPACE SYSTEMS • ANTI-SUBMARINE SYSTEMS • MILITARY AIRCRAFT • DC-8 JETLINERS • TRANSPORT AIRCRAFT • AIRCOMB® • GROUND SUPPORT EQUIPMENT



nomination. Final count: 4694 for, 6804 against. Landis, indicating he felt the contest was less than a fair one, will pursue "other paths of endeavor." There have been reports that he has been offered the CAB chairmanship.

AIRPORTS

More action on noise. Airlines are seeking "non-noise-sensitive" airports for jet training. Runway must be 7,000 ft. minimum with ILS to qualify. AAAE is canvassing its members for volunteers, but interested airports must explain why noise is *not* a problem.

Zoning for jet noise is under study. U.S. Housing and Home Finance Agency along with local government agencies are funding $45,000 study at Detroit's Metropolitan Airport to determine various ranges of vibration and noise resulting from jet operations.

Readings will be taken at various distances along runways and along approach paths. Results will lead to a set of principles for zoning airport areas for heavy and light industry, residential, school and church use.

Airport noise goes to court. Delta Air Lines has until Dec. 31 to show that it can conform with Port of New York Authority's Idlewild jet noise rule. This is the immediate outcome of PNYA's first attempt to enforce the rules in court.

Accusing Delta of a "worsening" noise record, the agency asked New York State Supreme Court to enjoin the airline from continued "indiscriminate" use of the field. But it agrees to Delta's request that answer to the complaint be delayed until Dec. 31 so the carrier can show that it can conform. But Delta's answer can be requested sooner if violations continue.

Even before receiving the complaint, the carrier had moved up a Convair 880 departure from 10 p.m. to 9 p.m. to avoid late takeoffs on banned runways.

LOCALS

Ozark Air Lines is up in arms over CAB's decision in the Kansas-Oklahoma case which it says takes away two good traffic points and gives them to Central. Some observers claim this marks the first time CAB has switched a route segment between locals.

Points at issue are Joplin and Springfield, Mo. Central's award is Tulsa-Joplin-Springfield-Ft. Leonard Wood-St. Louis. Ozark loses Joplin and Springfield plus its operation between the latter point and Columbia, Mo.

CAB says Central's operation will be more economical; Ozark claims CAB didn't use comparable cost bases. And with American out of the two controversial cities, it contends that its F-27s would carry $163,000 worth of business yearly between these points and Chicago. If CAB won't reconsider the decision, Ozark may go to court.

CARGO

Air Transport Assn.'s new 16-page booklet containing a set of standards and requirements for air cargo terminals is available at $1 per copy from ATA, 1,000 Conn. Ave., Wash., D.C.

TRAINING

New simulator for United. United Air Lines has purchased a Dalto (originally Doman approach landing and takeoff simulator) from Dalto Corp. Eastern was first customer, has unit in service.

Fairchild Astrionics Div. enters this market with what it calls a "visual night landing approach takeoff" simulator under a $775,000 USAF development contract. Fairchild says its unit is about half the size of earlier devices used by airlines.

FAA

International Flight Manual, including worldwide directory of airports, is off the press at FAA and available through Supt. of Documents, U.S. Gov't. Printing Office at 55¢ . . . **TSO N13b** on airport space requirements for ATC and flight service facilities is available from FAA Office of Management Services, Publications Section, Wash. 25, D.C.

SIDELINES

Example of tactics used in ALPA-Southern Airways strike: a sticker plastered in airport phone booth showing skull and crossbones (with skull wearing goggles and pilot's helmet) with warning, "Beware, don't fly Southern" . . . **American Airlines** will call its turbofan Boeing 707s and Convair 990s "Astrojets" . . .

Swingtail version of Canadair's turboprop CL-44 cargo transport made its first flight . . . **Boeing-Vertol** 107 twin-turbine transport helicopter flew for first time, is in flight portion of FAA certification program . . . **France's first production** Max Holste Super Broussard feeder airline transport will fly in January . . . **Chicago Midway** continues as nation's busiest airport, with 331,654 air carrier operations in fiscal 1960 . . .

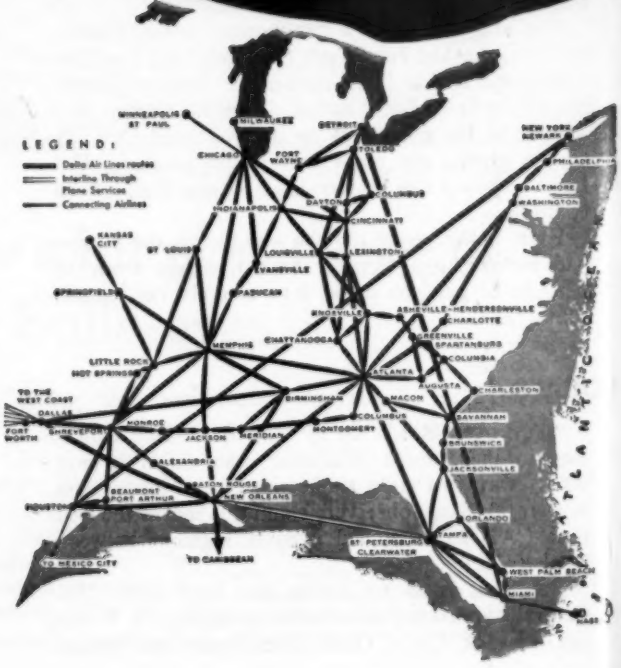
Qantas Empire Airways is 40 years old. The name stands for Queensland and Northern Territory Aerial Services, but in its unveiling on November 16, 1920, it was tagged Northern Territory and Queensland Air services. Fortunately, the error was righted or today it would be the unpronounceable NTAQAS.

To put it all in a jet pod...

DELTA is the JET LEADER to and thru the SOUTH

Delta was first with DC-8 or Convair 880 Jets over all routes served... and today offers up to 3 times more jet service than any other airline. Only Delta flies all 3 U.S.-built Jetliners...

Convair 880 Douglas DC-8
Boeing 707



DELTA

the air line with the BIG JETS

The Commercial SST . . . When?

An entirely new aircraft by 1966? Perhaps, with federal financing. Otherwise, it looks like 1970

By WILLIAM J. COUGHLIN

NO LONGER is there any significant debate on whether a supersonic jet transport is feasible for the airlines. The big question now on the SST is simply "When?"

A study of government intentions, technical developments and airline financing indicates such an aircraft may, in fact, be a lot closer than many people in the industry realize. The answer you get on exact timing depends a lot on where you ask the question.

"We know how to build Mach 3 engines today," the engine man says, pressing his fingertips together and gazing at the ceiling. "If we had the money and a firm go-ahead on a specific airplane, we could have the engines certificated in 1964."

"It's going to be about 1968-70 before the first supersonic transport is in airline operation," the chief engineer of a large West Coast airframe manufacturer estimates.

"We believe it can be done in considerably less than seven years with the right kind of research program," says another. "There are at least five companies that could start right in today."

"I expect supersonic transports to be available by 1967," the president of a U.S. airline tells a reporter.

Says another: "We're not interested in buying supersonic transports until well after 1970."

Generally speaking, the airframe and engine manufacturers are ready to go ahead today with design, development and manufacture of a supersonic transport—as soon as somebody coughs up enough money. And that means enough to cover development costs. The airlines, on the other hand, are in no hurry to support such a program until their current and future subsonic jet transport purchases are amortized.

National prestige at stake

But the question of an SST may not be left to the usual demands of the commercial market. An airliner which can whisk a head of state around the globe at 2000-mph is an item of considerable national prestige these days.

Therefore, serious consideration is being given to U.S. government support of a supersonic transport development program. With the advent this month of a new administration pledged to improve American prestige abroad such a program seems even more likely.

The question of timing of an SST, then, must be asked in two parts:

With strong government financial backing, when can we expect a U.S. supersonic transport in airline operation? The answer is probably by 1966, certainly by 1967. It also should be made clear that this refers to an entirely new aircraft, not a modification of the Convair B-58 or North American B-70. It also is certain that if an American SST is to be flying by then, government financing is a must.

Suppose there is no government financing for the SST program? Then there probably will be no U.S. supersonic transport operational much before 1970. However, the airlines will be ready for one by then and, surprisingly enough, the price appears within reach.

Let's take a look at the second situation first. If the government does not back the SST program, it's a good bet none of the airframe manufacturers will start immediate development with company funds. They were too badly burned on development costs of the subsonic jet transports.

Debt due to rise

Airline debt of the Big Four and Pan American presently outstanding and committed stands now at close to $1.2 billion and will fall to about $1.1 billion by the end of 1962. Purchases of short/medium range equipment will push this back up to $1.45 billion at the beginning of 1964.

By the end of 1964, however, these airlines will have taken delivery of most of their short/medium range equipment and the additional medium/long-range subsonic equipment needed.

Rising net worth of the airlines crosses the falling debt in a 1-1 ratio at about $950 million in late 1966. The airlines then will be in a good position to invest in supersonic transports.

Traffic demands, meanwhile, will be increasing. A recent market analysis by a West Coast airframe manufacturer estimates free world air traffic will reach 71 billion revenue passenger miles by 1970, 34 billion of it U.S. domestic. By 1975, the free world total is expected to be 93 billion, with U.S. domestic reaching 42 billion.

These are conservative figures. The recent United Research study for the Federal Aviation Agency estimates domestic traffic will reach the 42 billion figure by 1965, growing to 51.7 billion in 1970 and 64.2 billion in 1975.

It can be assumed, then, that with the airlines in a sound financial position, they will be ready to order supersonic transports for those routes where the SST would be practical.

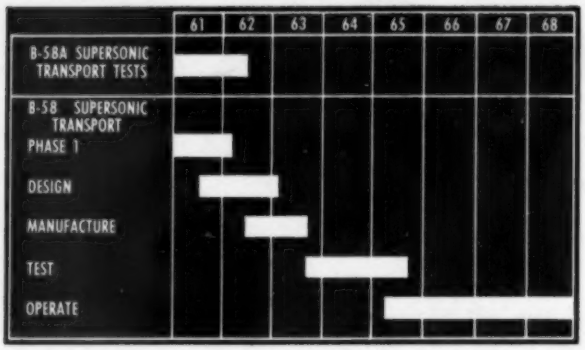
A Convair study estimates the total number of supersonic transports required by 1975 will be close to 150. Since each SST is expected to have the productivity of four subsonic jet transports and since the route miles for which it is economic are limited, the number of SSTs required by each airline will be relatively few.

American or United, for example, probably would require an initial fleet of about 10 aircraft. With the price running somewhere between $15 and $20 million a copy, the total investment per airline in an SST fleet would be about the same as that required for its initial subsonic jet fleet.

Convair estimates that with the airplane price based on a 20% return for the manufacturer and with only one manufacturer in the market, the return on investment for the operator would be about 50%, not including interest on debt or other indirect operating costs. If two manufacturers are in the market—resulting in a higher price per aircraft—return on investment would be about 30%.

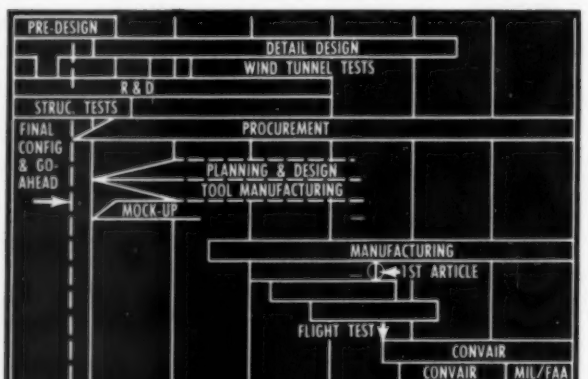
According to the Convair estimate, cost of the aircraft

B-58A SST Could Fly in '63



HOW A B-58A supersonic transport test project proposed by Convair could be scheduled. First flight: 1963.

Seven-Year SST Development Span



AIRLIFT'S VERSION of a Convair seven-year SST program from pre-design stage to certification by the FAA.

would be $15 million or less with one manufacturer in the market; $17.4 million with two and $20 million with three firms competing.

Assuming an available aircraft with an economic direct operating cost, it appears the SST would be a commercially sound proposition for the 1970s—with or without government support. The airframe and engine manufacturers say such an aircraft is feasible, with direct operating costs in the neighborhood of 1.56 cents per seat/mile.

But while there is any possibility of the government assuming the risk on development costs, the manufacturers and airlines, naturally enough, are going to indicate publicly that the SST without government support will remain only a designer's dream. The fact is that the same commercial pressures which brought the subsonic jets into operation will work in favor of the supersonic jet. What a government-financed program will buy is time.

How much time? To determine this, it's necessary to look at the problems standing in the way of a successful SST and estimate what it will take to overcome them.

First, the aircraft itself. U.S. manufacturers now are pretty well agreed the SST will be an aircraft of about Mach 3 speed made of steel or titanium. Considerable study is needed on their fatigue life at high temperatures.

Right now, it appears testing will have to be in real time. There has been no good correlation of data on simulated test times.

"What we really want is 50,000 hr. fatigue life on this aircraft with 30,000 hrs. as an acceptable minimum," says one designer. "At 20,000 hrs., it would be economic suicide."

This means a thorough-going laboratory program is required, one that even on a crash basis would take two to three years.

Other areas of SST design are believed well within the state of the art, even handling of the heating problem.

Engines are the second big question. Efficiency drops off fast between Mach 3 and 3.5 and a little improvement in the state of the art here could mean a lot.

Operational flight experience with a supersonic cruise aircraft is another must. A Convair B-58 not long ago encountered inverse yaw in engine-out tests above Mach 1.7 and was torn apart by yaw dampers equipped to deal with positive yaw. But even the B-58 spends very little time at high Mach numbers.

From the standpoint of airframe and engine development alone, thousands of flight hours will be needed.

"You just can't shake an engine down in less than 10,000 hrs.," says one designer.

Steps also must be taken to gain commercial pilot experience in supersonic aircraft, to study air traffic control problems, to investigate the effects of sonic boom from a high Mach cruise aircraft and to gain experience with airport ground handling facilities.

To study these problems and speed SST development, Convair and North American Aviation have proposed national research programs with the B-58 and B-70.

B-70 flight experience insufficient

It will not be enough to depend on the Air Force B-70 program for supersonic flight experience if the SST program is to be accelerated. It might be 1969 before even 2500 flight hours are acquired in the B-70 program. At speeds of Mach 2 and 3, flight hours are hard to come by.

Convair has suggested a step-by-step program in which the B-58 would be employed, starting in 1961, in simulated transport operation. National Aeronautics and Space Administration already is planning to carry out some testing next year with a B-58 bailed from the Air Force.

A true B-58 supersonic transport could make its first flight in 1963, giving the U.S. a prestige aircraft which could be used as a VIP transport and to gain operational experience on airline routes. This would be a 52-seat aircraft with a 190,000 lb. gross takeoff weight operating at a not-too-uneconomic 2.5 cents per seat/mile direct operating cost. Convair suggests government purchase of 12.

By late 1965, the B-58 SST would have accumulated 2500 flight hours. The 10,000 hours of engineering flight testing of the Pratt & Whitney JT11B-2 (J-58) engines would be acquired by mid-1967.

As the B-70 became available, it then could be phased in to provide experience in the Mach 3 regime. North American has suggested that several B-70s, perhaps equipped with 36 seats each, be superimposed on the airline operational environment in a high utilization test program.

These programs most likely would be financed through NASA. Whether as extensive as outlined, a federal SST research program of some sort appears assured. FAA has recommended a $400-million SST development program.

The other traditional method of support for U.S. transport development has been through the military. Wright Air Development Division now is encouraging the SST program with unfunded feasibility studies to be completed within six months. If these are followed by quick award of funded Air Force contracts for two prototypes, a program now under consideration, the supersonic transport will be available surprisingly soon, probably by 1966. ■

Next month: *Operational characteristics of a U.S. SST.*

Coach Dominates Canada's Fare Plan

Year-long study produces industry's first cost curves for fares

By ERIC BRAMLEY

BEHIND THE FARE reductions planned by Canada's two long-haul airlines is a completely revamped tariff structure and a conviction that coach service must be the basic means of air transportation.

In a move spearheaded by Trans-Canada and joined by Canadian Pacific, the nation's main air routes will have a tapered fare structure related to the actual costs of operating aircraft over various distances. The change is proposed for Jan. 2, 1961, provided it is not blocked by Canada's Air Transport Board or the U.S. CAB.

The year-long study by TCA that led to the new plan is probably the most detailed analysis yet made by an airline of its fare structure.

In most cases, there will be fare cuts on non-stop routes over 600 miles, the same fares in the 400-600 mile range, and increases under 400 miles. New fares will affect all 43 points served in Canada and the U.S. Here's how:

• Economy class (formerly called tourist) will be available at all points. Two out of every three seats will be economy, at fare of about 66% of first-class. Viscounts will be converted to five-abreast 54-seat all-economy, with two stewardesses and hot meals. The cheaper seats will also be available on all DC-8s and the upcoming turboprop Vanguards. There is no jet surcharge and Canada does not have a transportation tax.

• Seasonal roundtrip excursion fares, 25% lower than economy, will be effective October through May within Canada only, applicable on a 23-day weekend and 24-day weekday basis.

• First major revision in years is made in baggage allowance. Compared with the U.S. 40-lb. limit, Canadian travelers will get 44 lbs. economy and 66 lbs. first-class, the same as overseas. Excess baggage charges will be one-half of 1% of the economy fare rather than of first-class.

• First-class family plan discount will be cut from 50% to 33 1/3%, and discounts are eliminated for first-class roundtrip, conventions, groups and commercial travelers.

Present U.S. jet coach roundtrip New York-Seattle is $277.20, including surcharge but not tax. TCA will offer New York-Vancouver economy class of $230 roundtrip (down from present $246), with excursion fare set at $212. First-class is reduced from $355 to $342.

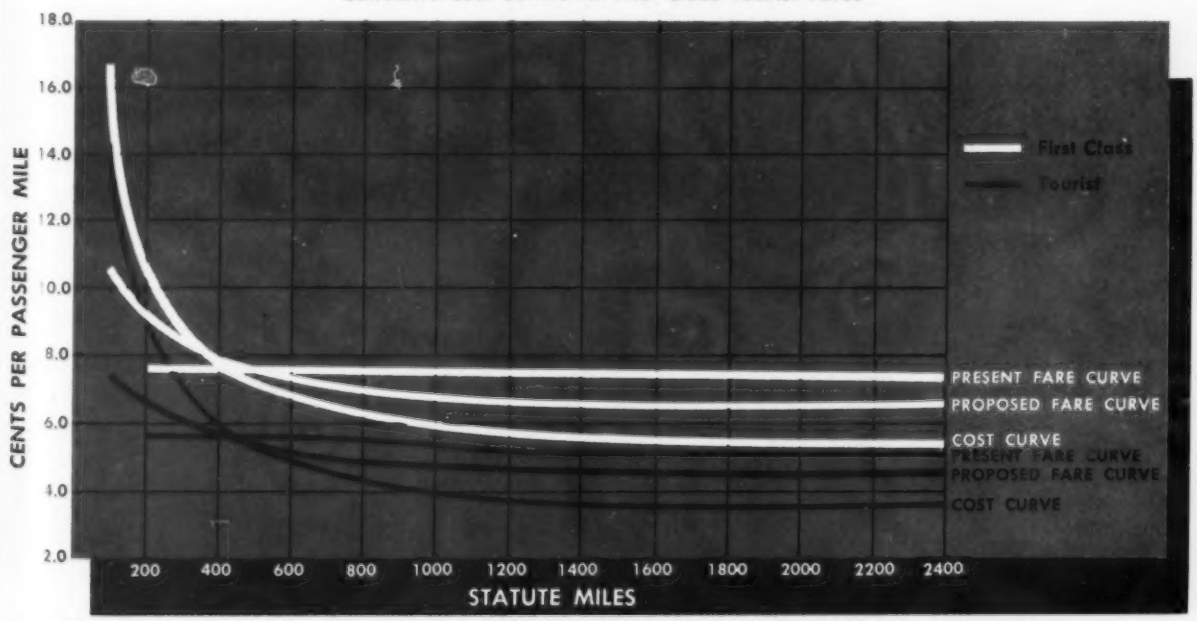
At present, Canada's air fares are not low, compared with the U.S. On long hauls, they are generally higher, although somewhat lower on short distances. Under the new set-up, they will be about 7¢ a mile first-class on distances over 2,400 miles against 7.3¢ U.S. (including jet surcharge). Economy will be 4.6¢ against 5.6¢. At about 900 miles, Canada will offer 7.5¢ first-class and 5¢ economy compared with 7.5¢ and 5.7¢ U.S. At 300 miles, comparison is 9¢ and 6.3¢ against 7.6¢ and 6.2¢.

Last year, TCA began its detailed study of the variation in operating costs in relation to flight length. It worked out composite cost curves for all three planes to be operated in 1961. The curves confirmed that the existing fare structure, except in the 600-mile range, was poorly related to costs and discriminated against the long-haul passenger.

Fare curves were worked out which are closely related to the cost curves, with one exception: extremely short routes. On such routes, the cost curve results in prohibitively high fares, so TCA applies a $7 minimum on stages under 100 miles.

Given credit for the new fare structure are W. Gordon Wood, TCA's v.p.-sales; N. E. Taylor, economic research chief; J. E. Nickson, general sales director; Jack Lane, his special assistant, and G. R. Wilson, Trans-Canada's passenger sales director. ■

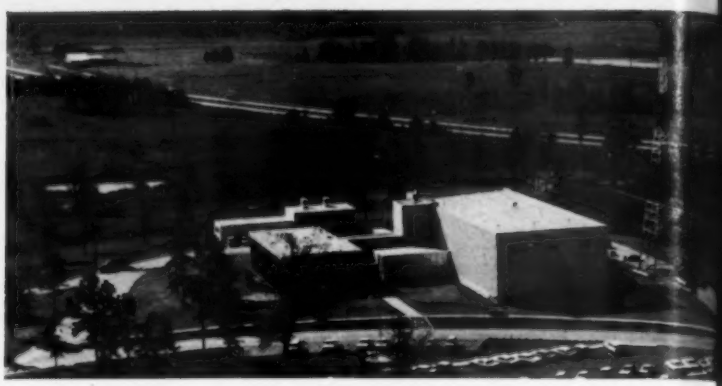
Canada's Cost Curves for First Class/Tourist Fares



IMPACT OF LENGTH of haul on costs is shown dramatically by Canadian study. Cost level off above 1,400 miles.

FAA Photo.

CENTER CHIEF James B. Smith oversees staff of 350 in nation's most modern air traffic control center.



HELICOPTER VIEW of Atlanta center shows modern buildings situated near highway 41, main artery to Florida. Control room is on the right

FAA's Third New ARTC Center Opens

FAA's OVERBURDENED air route traffic control system, racing hard to keep abreast of more and faster aircraft, both military and civilian, is feeling the effect of a series of shots in the arm. One by one, larger, more up-to-date facilities are being dedicated to efficient deployment of the communications and surveillance aids used by the controllers and coordinators who keep the nation's IFR airways in order.

A brand new, ultra-modern edifice near the placid town of Hampton, Ga., half an hour's drive from bustling Atlanta Airport, is number three on the FAA's 26-item construction agenda. In dollars, the new center is worth millions. But the expandable, efficient, cleverly-illuminated and carefully engineered facility is an investment in air safety destined to pay handsome dividends over future years.

The center is the nucleus for the Atlanta sector's 14,415 miles of airways. More than 350 persons—controllers, coordinators, supervisors, technicians and maintenance personnel—are employed there. The 54,000 sq. ft. of floor space in the new building contrasts with 2,000 sq. ft. into which the old facilities—and just as many people—were crammed.

On a typical day, Atlanta may work up to 1,900 flights. During peak periods as many as 112 aircraft may be under control simultaneously. It is the fourth busiest center in the nation. The new facilities will be put to good use. ■

AIRLIFT Photo.

LONG LINE of flight progress strips spans entire width of control room.

AIRLIFT Photos by Phil Gerard.

FLIGHT DATA supervisor Eugene Page watches assistant controller Fred Pike update flight progress strip. Strips are printed out by computer much faster than by hand.

FAA Photo.

tlanta

ASSISTANT controller Bill Bearden (right); controller Charles Grube (2nd from right); and coordinator Jimmy Coleman (2nd from left) work Birmingham sector as coordinator from adjacent position observes. AIRLIFT Photo.

AIRLIFT Photo.

MICROWAVE TOWER receives radar information relayed from antenna site.

FAA Photos by Jacques Upshaw.

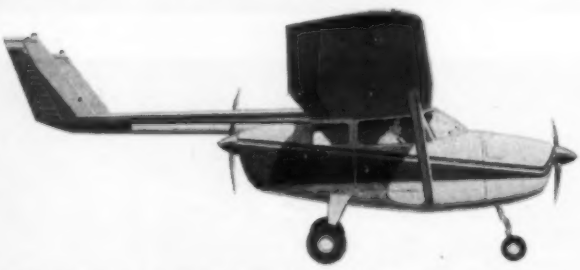
OVERALL VIEW of control room was made at 3 a.m., Oct. 16, just five hours after transfer of control from old to new site. Transition required only 23 seconds.

PIPER's PA-28 "Cherokee."

Four Newcomers Vie for Air Taxi Market

CESSNA's 185 "Skywagon."

BEECH Aircraft's Model 55 "Baron."



ARTIST's conception of Cessna's intended "pusher-puller."

AERO Commander's Model 500B.

CESSNA's 310F five-seat twin.

By DANNA KUSIANOVICH

THE AIR TAXI OPERATOR who is in the market for new equipment will find much to choose from in the 1961 offerings of the "Big Four" light aircraft manufacturers.

Four "all-new" models hold the spotlight in the 1961 lines of Beech, Cessna, Aero Commander and Piper. The 25 carry-over models are marked by design refinements and small added "luxuries." Prices have been increased an average of four to five per cent over 1960.

The four new models, unveiled at showings in November, are:

1. The Beech Model 55 "Baron." A five-place, $58,250 "big brother" to the Travel Air, the Baron is powered by 260-hp Continental fuel-injection engines, and cruises at 216 mph at 65% power. Top speed is 230 mph and range is 1,000 miles.

2. The Cessna 185 "Skywagon." The 185 is a larger, six-place version of the 180 utility plane, with a useful load of 1,680 pounds. It also uses the 260 hp Lycoming engine, and cruises at 165 mph. Price is $18,950.

3. The Piper Cherokee. Billed as a potential replacement for the Tri-Pacer, this all-metal, low-wing, fixed-gear plane seats four and sells for $9,995. Its engine is the 160 hp Lycoming, and its cruise speed is 130 mph.

4. The Piper Colt. A two-place "sports plane" selling for $4,995, the Colt is powered by a 108-hp Lycoming engine and cruises at 115 mph.

Coming up in 1962 is the revolutionary new Cessna light-light twin, with one pusher and one puller engine. Few details have been revealed, but the aircraft will reportedly have a high wing, fixed gear, "about 400 hp total," and the lowest price tag in the twin-engine field.

Following is a brief rundown of details of interest to air taxi operators in the rest of the 1961 line:

Aero Commander Inc. 500A—twin Continental 260 hp fuel injection engines, 220 mph cruise, 1,420 mile range, 1,995-lb. useful load, $75,000; 500B—twin 290 hp Lycoming engines, 225 mph cruise, 1,250-mile range, 2,450-lb. useful load, $81,500; 560F—twin Lycoming 350 hp engines, 234 mph cruise, 1,500-mile range, 2,850-lb. useful load, $98,500; 680F—twin Lycoming 360 hp engines, 255 mph cruise, 1,400 mile range, 3,200-lb. useful load, $113,500; 720A—a pressurized version of the 680F, no specifications available. All have a seating capacity of five to seven.

Beech Aircraft Corp. A33 Debonair—Continental 225 hp powerplant, 185 mph cruise, 1,255-lb. useful load, $21,750, four seats; N35 Bonanza—Continental 260 hp engine, 195 mph cruise, 1,200-mile range, 1,270-lb. useful load, $26,500, four seats; 95 Travel Air—twin 180-hp Lycoming engines, $51,500, no changes from 1960; J50 supercharged Twin Bonanza—twin 340-hp Lycoming engines, no specification changes from 1960, $100,000; D50E Twin Bonanza—twin 295 hp Lycoming engines, no specification changes from 1960, $87,250; 65 Queen Air—twin 340-hp Lycomings, six-place, 200 mph cruise, 2,900-lb. useful load, $126,000; G18S—twin P&W 450 hp engines, 200 mph cruise, 3,865-lb.

Continued on page 28

PROVEN IN SERVICE

Both airlines and business aircraft operators have found the AVQ-50 Weather Radar meets their requirements for use in aircraft where size and weight are important economical factors

Simplicity of design, ease of maintenance and a high degree of reliability make the AVQ-50 ideal for installation in aircraft ranging in size from light twins to Constellations.

First introduced in 1957, the AVQ-50 Weather Radar is still the most compact, modern design available today. Now flying in hundreds of planes, this radar has been literally "proven in service."

You owe it to the efficiency of your operation to investigate the application of the AVQ-50 to your airline or business fleet . . . For details contact RADIO CORPORATION OF AMERICA, 11819 W. Olympic Blvd., Los Angeles 64, California, or your nearest Authorized Dealer for RCA Aviation Equipment.

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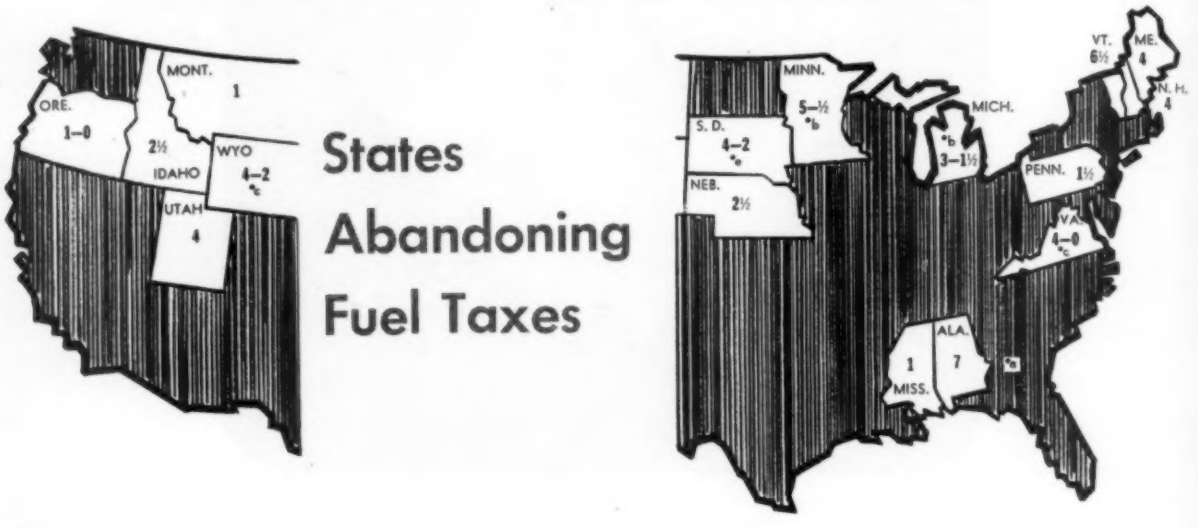
useful load, 7-9 seats, new picture windows in cabin, $132,300.

Cessna Aircraft Co. 150—100-hp Continental engine, 121 mph cruise, 630-mile range, two seats, $7,495; 180—Continental 230 hp engine, 160 mph cruise, 845-mile range, four seats, $15,275; 172—Continental 145 hp engine, 130 mph cruise, 790-mile range, four seats, $9,795; Skyhawk—deluxe version of 172, with extra equipment, $11,475; 175—Continental 175 hp geared engine, 140 mph cruise, 755-mile range, four seats, $11,995; Skylark—deluxe version of 175, priced at $13,775; 182—Continental 230 hp engine, 157 mph cruise, 835-mile range, four seats, $15,490; Skylane—deluxe 182, priced at $17,950; 210—Continental 260-hp engine, retractable gear, four seats, 199 mph cruise, 1,075-mile range, $23,450; 310F—twin Continental 260-hp engines, 220 mph cruise, 1,340-mile range, five seats, $62,500.

Piper Aircraft Co. Piper's twin-engine models, the Aztec and the Apache, will not be brought out until early 1961. Details and prices are not available, but only minor changes from 1960 are expected. There are also few changes in the single-engine Comanche, which is again offered in 180-hp and 250-hp versions. Comanche price tags for 1961 are $16,445 for the 180 and $20,485 for the 250.

Common features to nearly all the 1961 models, regardless of manufacturer, are newly designed instrument panels, slight increases in payload, and increased visibility through use of more and larger windows. ■



States Abandoning Fuel Taxes

**a. In Georgia, avgas imported by airlines for use in interstate commerce is exempt. Other users pay 1¢ per gal. Kerosene is 1¢ per gal.*
**b. In Michigan, scheduled carriers pay 1½¢.*
**c. In Minnesota, South Dakota and Wyoming tax is on sliding scale depending on volume.*
**d. Oregon does not tax fuel used in international operations.*
**e. Virginia refunds full 6¢ on fuel purchased in the state and consumed outside the state. A 2¢ refund is made on gas consumed in the state.*

MAP OF STATES indicates degree of local taxation on aviation gasoline and kerosene. Dark states have abandoned fuel taxes.

THERE'S ONE BRIGHT SPOT in the gloomy picture of rising airline costs: the trend is away from state aviation fuel taxes.

At present, 32 states don't tax aviation gasoline and 31 don't tax kerosene. Total tax bill in the other states is estimated at $6-$7 million annually.

In recent years, several states have removed levies. Since 1947, no state has singled out aviation fuel for taxation.

From 1947 through 1959, at least 75 bills were introduced to impose or increase avgas charges. All failed. Proposals are expected next year, with 47 state legislatures in session, but no serious threats are seen now.

Airlines have been successful in convincing states that air transport, as an off-highway use, should be exempt. They also say they are paying their way without fuel taxes, through landing fees, rentals, other charges and the same general business taxes as other industries. In many cases their arguments have been supported by general aviation interests.

Says one industry official: "Airlines use about one gallon of fuel to earn $1 revenue. Therefore, a 1¢ fuel tax is a 1% gross income tax."

High taxes discourage business

More and more states are realizing that taxes drive away business. Unless it's absolutely necessary, airlines don't refuel in high-tax states. Fortunately for the carriers, most of the tax states are not areas where large fuel purchases are necessary (Michigan, Pennsylvania and Hawaii are exceptions).

In 14 of the 18 states that tax avgas, kerosene brings the same rate. Four are lower: Oregon, ½¢ per gal. against 1¢ avgas; Alaska, 1½¢-3¢; Maine, 2¢-4¢; Pennsylvania, which temporarily cut kerosene to 1¢ against 1½¢. Industry hopes the decrease, scheduled to expire next May 31, will be extended. In Georgia, airlines import avgas and are not taxed. Other users pay 1¢ and kerosene is 1¢.

Biggest avgas-kerosene tax is imposed by Alabama—7¢ per gal., the same rate as for highway users (Vermont's 6½¢ is also the same). Estimate is that Alabama takes in close to $400,000 a year. Funds go into airport construction and to finance the state aeronautics department. Airlines argue that they get little benefit from the airport program, which mostly involves smaller fields. Little refueling is done in Alabama, and other servicing operations are minimum. Without a tax, many more dollars would be spent in the state, carriers claim.

Although it doesn't have the biggest tax, Hawaii probably realizes the most revenue. Airlines must take aboard large fuel loads, and the 3½¢ levy is estimated to amount to $2 million yearly. Alaska tax is 3¢.

States that have dropped taxes in recent years are Louisiana, 9¢; Tennessee, 7¢; South Carolina, 7¢, and Ohio and Kansas, 1¢ temporary charges. ■

Sabena 'Copters Paying Off

An interview with Anselme Vernieuwe,* senior vice president of Sabena Belgian World Airlines

*Pronounced Ver-nee.

Anselme Vernieuwe was a combat pilot in Britain during World War II. He won the Royal Air Force's Distinguished Flying Cross, among other awards. He joined Sabena in 1945 as operations manager. Vernieuwe holds Belgium's No. 1 helicopter pilot license. He has been the driving force behind Sabena's helicopter program and has played a leading part in the helicopter activities of the IATA Technical Committee as well as serving as chairman of the committee.

Q. *How long has Sabena been operating scheduled passenger-carrying helicopters?*

A. Since 1953. We started with Sikorsky S-55s flying to Lille (France), Rotterdam and Maastricht (Netherlands), Antwerp and Liege (Belgium). In 1955 we extended to Cologne and Bonn (Germany) and to Dortmund (Germany) in 1956. The acquisition of eight S-58s in June, 1957, enabled us to start operations to Paris. In June, 1957, we carried our 100,000th helicopter passenger and reached the quarter-million mark in September, 1959. We have 22 helicopter pilots with more than 35,000 rotorcraft flights to their credit.

Q. *What have been the advantages of helicopter operation to Sabena?*

A. We have attracted many people who previously had never flown in an aircraft. Operating to cities hitherto not served by air transport, we have been able to bring new business to our fixed-wing aircraft system. We regard the helicopter as an auxiliary to our fixed-wing aircraft. At the moment about 40% of our helicopter passengers continue their journey by fixed-wing aircraft or vice-versa. In 1958 there were 17,982 passengers in this category. If the helicopter had not been available to take them to or from Brussels they might not have patronized our fixed-wing services.

Q. *What is needed to make your helicopter operation more profitable?*

A. The lengthening of intervals between regular overhauls would certainly help to reduce our operating costs. Our main hope, however, is in the multi-turbine models that will open the era of instrument flying for civil helicopters.

Q. *How have you managed to avoid complaints from the public about helicopter operations in the center of cities?*

A. The major reason why we have been successful in not antagonizing the public with the noise of our helicopters is that we make our approach to the heliport over uninhabited areas, waterways or industrial zones. For landing and take-off, pilots are instructed to avoid all unnecessary movement at ground level, and to use minimum required power for the take-off.

Moreover, when the engine is being warmed up on the ground, the exhaust has to be aligned with the axis of the runway. In the air, pilots have to fly at 2,000 feet unless weather conditions dictate a lower altitude. We tried putting mufflers on the engine exhaust but the results were disappointing and the experiments were finally halted. Turbine helicopters will raise problems of a quite different nature.

Q. *What has been your experience with the S-58?*

A. We accumulated 36,150 flying hours with eight S-58s from the beginning of 1957 to the end of July 1960. Utilization varies considerably between the summer and winter seasons since we only operate helicopters between sunrise and sunset. In summer each S-58 averages 170 hours' flying per month. Complete overhauls take place in the winter so our entire fleet can be fully operational through the summer.

In the early stages there were problems such as cracks in the structure and in the main crankcase, ground resonance, and faulty functioning of the coupling gear. In cooperation with Sikorsky we have solved most of them.

However, there are still two important unsolved problems. First, the Wright R-1820-84 is liable to serious breakdowns involving sudden stoppage in flight. Most serious continues to be the breaking of the main con-rod bearing on the crankshaft. This may occur after a comparatively short period. Despite several modifications, the defect is still there and engine overhaul life has to be kept to 600 hours. Actually, we average about 500 hours before each R-1820-84 has to be removed.

Our second unsolved problem relates to the low life of components. Far too many are in this category. This necessitates the systematic replacement of parts still apparently intact and the overhaul of different assemblies within the normal period. It is very difficult, indeed, almost impossible, to synchronize parts removals with major overhauls.

Q. *What do you see as the most important work for the helicopter in the service of European airlines in the future?*

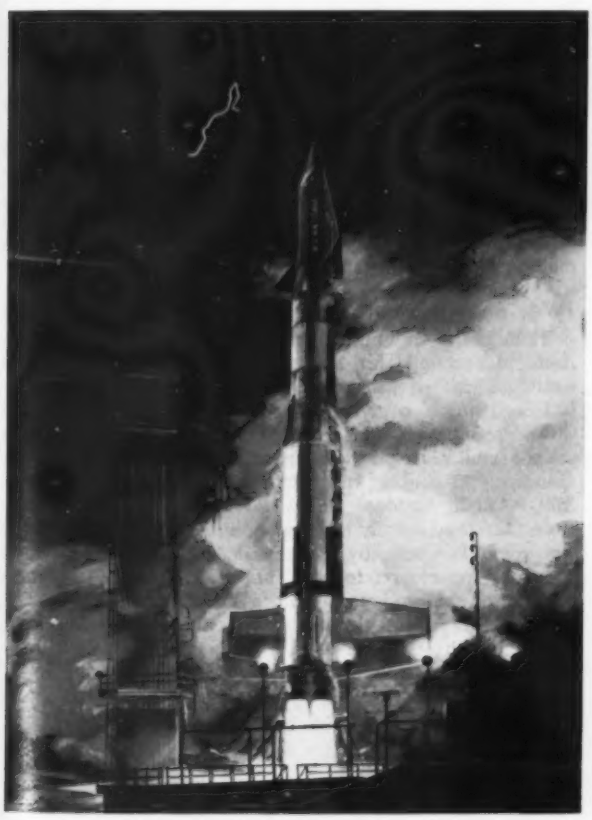
A. The number of airports open to international traffic cannot be increased indefinitely. Many cities are handicapped by being situated too far from the nearest airport. Now, thanks to the helicopter, no city need be outside the international air transport system. There will also be an increasing demand for travel by helicopter between city centers, and between city centers and airports.

The helicopter is particularly valuable in linking the several airports of large cities. However, in Europe the greatest demand in the next few years will be for more helicopter service between densely populated areas of Western Europe. ■

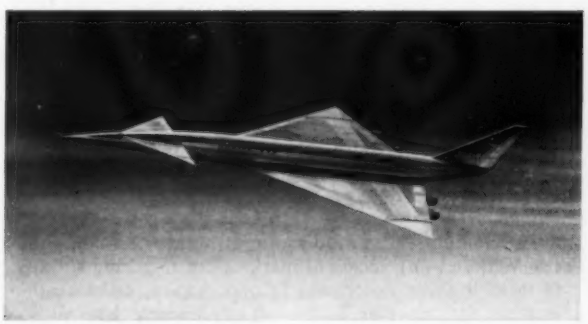
BULLETIN FROM BOEING

...WHERE CAPABILITY HAS MANY FACES

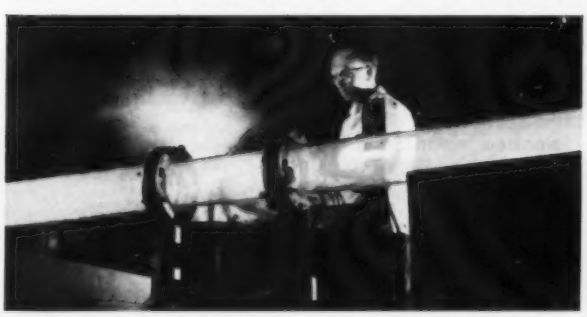
Expanding the frontiers of knowledge through basic research is the business of the Boeing Scientific Research Laboratories, left. Here Boeing scientists are at work in the fields of solid state physics, flight sciences, advanced mathematics, plasma physics and geo-astrophysics.



SPACE GLIDER. Artist's concept shows Dyna Soar manned space glider perched atop modified Titan ICBM for launching. In space, the glider and booster would separate, leaving Dyna Soar vehicle in piloted, near-orbital flight. Pilot could later glide to conventional landing at a selected base. Dyna Soar is being developed by the U. S. Air Force in cooperation with NASA, with Boeing as prime contractor for both the system and the glider.



FUTURE SKYLINER. Boeing, builder of famous 707, America's first jet airliner, has long been at work on next generation of aerial transports, which could look like the Boeing design pictured above. Supersonic jetliners, probably a decade away, could have speed in neighborhood of 2,000 miles an hour. Flight time, from Paris to New York, would be about two and a half hours!



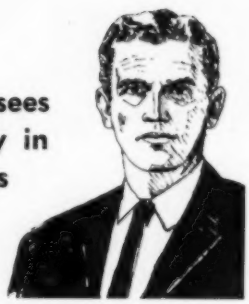
SHOCK TUBE. Industry's most powerful shock tube, designed and built by Boeing Scientific Research Laboratories scientists, creates shock waves which begin at 300 times speed of sound, then collide in tube at "slowed" rate of 80 times speed of sound. Gas temperature within the tube reaches approximately one million degrees. Studies could be important in developing effective ion and plasma-propulsion systems for use in space.

BOEING

JET AIRCRAFT, MISSILES, HELICOPTERS, GAS-TURBINE ENGINES, WEAPON-SYSTEM MANAGEMENT, SPACE-FLIGHT VEHICLES AND SYSTEMS.

Is Local Subsidy Here to Stay?

Allegheny's Les Barnes sees six ways to cut subsidy in part 4 of *AIRLIFT'S* series



WE MUST FIRST CONSIDER these facts as a basis for any discussion of subsidy:

• There is a federal policy which recognizes that both large and small communities shall have scheduled airline service.

• The local airlines were created to perform services for the smaller communities. This is still their major responsibility.

• Because a majority of intermediate cities served by the locals cannot be expected to produce revenues sufficient to meet costs and produce a fair return, subsidy funds are provided.

• The amount is a product of: (a) number of communities served, and (b) access to markets not requiring subsidy.

If there is to be no change in opportunity, no relaxation of restrictions, no elimination of uneconomic competition and maintenance of a status quo, then subsidy will be a permanent fixture for local airlines.

The amount will be dependent upon the mixture of communities requiring subsidy and those which do not, and the degree to which it is required. The amount will vary between carriers, but none will be free of it. I feel that subsidy will be permanent only if the present situation is maintained. Now, if I were king (so to speak) I would:

1. Remove all local airline operating restrictions to permit locals to participate equally in the dense, short-haul and medium-range markets. The Board should take such action as a matter of policy pursuant to its exemption powers under section 416 of the act.

Nonstop competitive services should be a permissive authority, not a required authority. While locals would be free to participate in competitive markets, they should not expect subsidy for losses.

For a flight to be eligible for subsidy over such routes, it should serve at least one intermediate city on the route. No legislation is required to implement such a policy.

2. The Board should eliminate unproductive competition, suspend dormant, unused trunk airline certificates, and use trunkline mergers proposed or expected as the arena for realigning and modernizing trunkline and local airline route certificates into a sensible pattern.

The Board should make an immediate study of the following:

(a) Analysis of city pairs where competition between a local and a trunk appears to be economically unwarranted.

(b) Analysis of routes where replacement of trunk carriers by locals at intermediate points has been only partially accomplished, but where it would improve service and reduce subsidy.

(c) Analysis of dormant trunk certifications between shorthaul city pairs which may be profitable for locals.

The Board should consider additional suspension of trunk authorities where analysis indicates good potential for locals.

The effect on subsidy that complete replacement would have would be astonishing. It is impossible to predict the precise amount which could be shaved off the nation's annual subsidy bill. A conservative estimate, however, would be somewhere between 10% and 20% of the total now required by some of the locals.

Forthcoming trunk mergers provide a basis for realignment of the overall transportation picture. The trunk portion of the industry is very sick and has been for a number of years. Two major trunk mergers have been announced. Within the next 12 months, there will be more trunk mergers, with one probably being announced before the end of this year. These mergers are the product of extreme economic pressures; they will be approved and they should be.

The cause of today's problems must be shared by both trunks and CAB. Massive route cases provided the platform for realignment of the trunk system. The only service obligations which the trunk airlines sought to lose were cities considered "loss points" by the airline involved.

There have been but two attempts on the part of the trunks to seek system realignment or redefinition of their functions. American Airlines has long concentrated on longhaul major markets and has encouraged the Board to assign local airlines to all intermediate cities and even to major shorthaul markets.

TWA: an exception among trunks

TWA is the only airline that has sought realignment of a route in exchange for the award of another route which would strengthen its system (i.e. Cincinnati-Detroit, which has been turned over to Lake Central.)

The significant point is that the trunks have generally sought and received new routes without analyzing their systems and seeking to dispense with routes which no longer "fit."

In fact, they usually have opposed entry of a local carrier into markets where, by any reasonable economic standard, they had no reason to be. The trunks that are in most serious trouble today are those which sought expansion without analysis of their aims or concentration on longhaul competitive objectives.

The Board has the statutory ability to suspend or to realign routes. However, it has been reluctant to use that authority. I don't think the industry wants it to use it. With all but one of the major cases having been decided, the opportunity to use a route proceeding as the arena for route realignment has passed.

Now the opportunity is again presented. The Board should use the mergers as a forum for determining what routes should go to the absorbing carrier and what routes, points and services should be spun out from the new combinations. Such routes should be reassigned so they make economic sense. Economic factors plaguing carriers in trouble today will persist even though absorbed by a different body.

The impetus for realignment must come from the airline industry, but the Board should be receptive. Allegheny will participate to the maximum in any trunk merger proposal before the Board.

3. The Board is updating its mail rate policy. This is badly needed. We endorse the prospect of the class rate policy on January 1, 1961. I think CAB has recognized

the damage done to the locals' financial stability in the past, and has recognized the need for adequate earnings.

Evidence indicates the Board is concerned today over the lack of any local earnings over the past 15 years and is seeking to do something about it.

It makes no difference what the rate of return is if the airlines do not recieve it. The locals have not recieved even the old 8% return. Lower cost financing, increased ability to acquire more productive and economical equipment is entirely dependent on earnings. This atmosphere is a "must" preliminary to any significant reduction in subsidy. I think the Board is earnestly seeking to correct this situation.

4. The Board should revise its "use it or lose it" policy and should seek congressional endorsement. Subsidy is a product principally of the number and size of cities served which require subsidy support.

The Board's criterion for subsidy eligibility should be based on boardings per departure rather than monthly total boardings.

Without a firm criterion there is no measure of whether a community would be entitled to airline service once its airport is built. It is a Board/Congress responsibility to define it. Local carriers, in their role as contractor in fulfillment of federal policy, cannot properly insert themselves into this question.

5. The transportation tax should not be repealed. I do not expect our position on this to be popular. To the best of my knowledge we are the only one now holding this position. We have not been vocal on the matter in the past, but expect to be in the future.

This year, Allegheny will collect over $1 million of transportation tax just for passage on our own flights. We will collect another half or three-quarter million over the routes of other airlines. This will increase to between two and three million dollars annually by 1963. Airlines last year collected 10 to 15 million dollars in transportation taxes.

Public payment of these taxes is an indirect return of subsidy to the government. I do not agree that repeal of the transportation tax will increase revenue. Persistent industry efforts to increase fares indicate otherwise. Only in connection with international travel are passengers departing from outside the country in order to avoid the tax.

6. FAA and CAB should work together to see that area airports are developed for a periphery of cities. Funds for airline service should be denied if good service already exists within less than an hour's driving time from a community.

Adoption of these recommendations most certainly would reduce subsidy; could even eliminate it entirely. One ultimate figure, however, will depend upon the floor established by the Board for continued community service eligibility, based on population densities and other revenue-generating characteristics. ■

Bonanza Starts All-Turbine Operations

WHEN FLIGHT 65, a DC-3 five-stop Salt Lake-Phoenix schedule, terminated on Oct. 31, it marked the end of piston-engined operations for Bonanza Air Lines.

The next day the company claimed the title of the first all-turbine airline in North America, covering its 2,244 route miles with eight Fairchild F-27s. The switchover came only 20 months after BAL's first turboprop went into service.

For president and board chairman Edmund Converse it was the high point of 14 years of building the company from a charter operation that started in January 1946. Las Vegas-Reno scheduled service opened the following August with one DC-3, and the fleet eventually increased to 10—four obtained from United, two from TWA, and one each from American, Northwest, Continental and Western. In 14 years, the DC-3s hauled 954,353 passengers.

The F-27 has been a bonanza for Bonanza. Commercial revenue in a recent 12-month period was 63% ahead of 1958, when the first plane was introduced. The 176-mile average stage length on which the turboprop has been flown makes BAL the lowest cost F-27 operator. Now, with the switchover completed, BAL is set to capitalize fully on the economics of turbine power. ■

FAIRCHILD'S TWIN-TURBOPROP F-27 (below) takes over Bonanza's entire route operation only 20 months after its introduction.

TECHNICALLY SPEAKING

By Joe Murphy

AA leads Electra defense strategy . . . FAA's airport attitude is hurting . . . Paris Air Show notes

Electra truth squad—There no doubt are many public relations people who will disagree, but American Airlines' campaign to openly discuss and defend the safety of the Lockheed Electra at press briefings in 17 cities is a laudable effort.

AA's session in Washington gave us the most concise, although still preliminary, report of what happened in the Boston accident. The aircraft took off, hit the flock of birds at about 40 feet and eventually reached 200 to 300 ft. altitude.

In the process, the No. 1 engine was feathered automatically, the negative torque signal was activated on the No. 2 and 4 and the No. 3 was at takeoff power. It appears that the No. 4 was surging back to T/O power, thus forcing the pilot to cope with almost full asymmetric thrust at a time when he was already totally preoccupied with emergency operations necessitated by the power loss.

Airport indigestion—One of the sad results of the Quesada-Eisenhower Administration's attitude on airports is the virtual moratorium on action to cure the growing epidemic of airport traffic indigestion. The disinterest at the top is damping the enthusiasm of FAA staff people to do something about it.

In one of the first briefings by industry after joining the Airways Modernization Board-FAA complex, airport people asked Quesada three questions: Where should high-speed turnoffs be located? What kind of runway lighting should be planned? How much separation is needed for parallel runways?

This was three years ago. Airport people are still waiting for a firm answer on every issue. Meanwhile, at FAA's own Washington National Airport, the indigestion is at its worst. Yet surprisingly (for an ex-airline man) deputy FAA chief Jim Pyle asks us, "Why don't the carriers change their schedules to ease the jam?" A weak approach, we think. It just could be that airlines schedule their flights when the public wants to travel.

Prelude to Paris—With the Paris Air Show only six months away, we're reminded of the ills of past events, particularly the "scalping" of exhibitors. Fees like $1,000 for ten days' use of flowers; attempts to put the bite to exhibitors for $40 tips for site selections. And there's the electrical power shortage that disables every operating exhibit despite payment of a $300 fee for a converter that theoretically is supposed to make everything perfect. Maybe things will change in '61. There's still time if anyone's interested.

No space for space—Speaking of shows, unless somebody, somewhere, in the aviation, space and missile field gets busy and assumes some leadership, the New York World's Fair will be without an aviation exhibit. We can't imagine how the situation has progressed this far without action. Takes an awful lot of nearsightedness on the part of the fair committee, we think.

Rugged light bulbs—There's more than idle airline interest in getting some astute lamp manufacturer to come up with ruggedized light bulbs for aircraft use. Program would follow much along the lines pursued by Aeronautical Radio, Inc. in the evolution of ruggedized vacuum tubes for airline use. One major trunk spends better than $90,000 a year on light bulbs for its fleet!

New projects—Boeing has given Sundstrand a letter contract for a starter/constant speed drive unit for the 727 . . . Lockheed has a letter of intent from Los Angeles International Airport to build a coin-operated monorail transfer system for its new airport terminal layout. The passenger will simply deposit his quarter and press a button to get where he wants to go . . . TWA is working with AMF on evaluation of its new wheel mover/starter/ground power unit for jets at Idlewild.

Design note—TWA's experience with varying passenger loads in the separated 1st class and tourist sections in 707's points to a need for "zone" temperature control as opposed to overall cabin temperature control.

Good technical info—Our vote for the best job of keeping airline mechanics informed goes to American Airlines and its weekly maintenance letter. We'd like to see what many of the others are doing, but AA's effort by Ed Smick, Al Botsford and Co. is first class. Recent issues on airborne radar and fuel quantity system maintenance were outstanding.

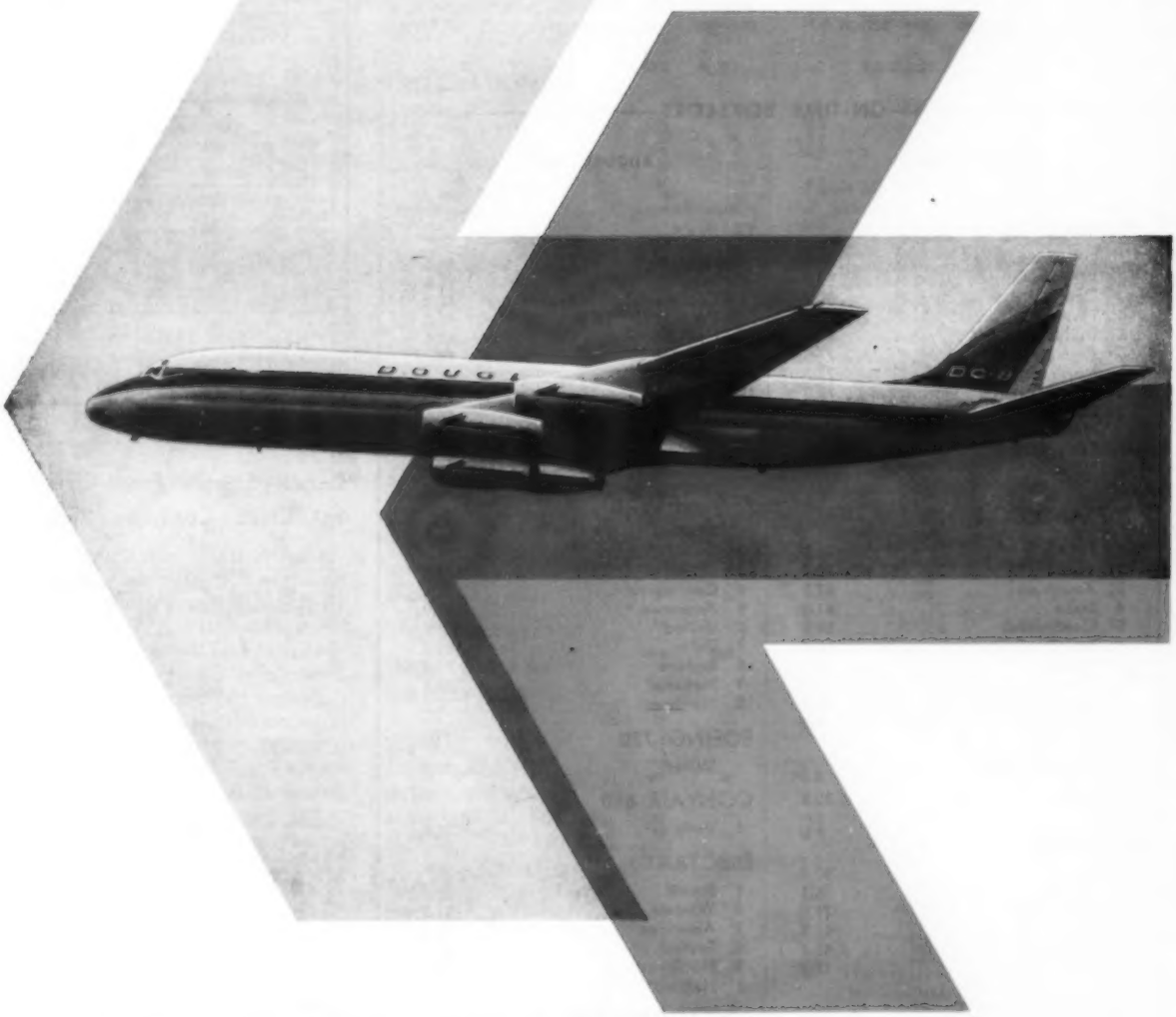
Overrun protection—Sweden's Borgs Fabricks AB has developed what t calls the BEFAB Safeland airport ove - run barrier capable of halting je s weighing up to 310,000 lbs. It use s vertical nylon ropes to engage the wi g leading edges, distributing the loa d over the whole span. System is a Swedish Air Board development. ■

SIGNS OF THE TIMES

AIRLIFT Photos.

THE BIG BOOM in airport terminal building is taking its toll of structures that made all this possible. As Atlanta's fancy new edifice nears completion, even the nameplate on the present building deteriorates. (Airport police wouldn't let us photograph the new one).

CLEAN FUEL



WARNER LEWIS EQUIPMENT PROTECTS THE JETS

Clean jet fuel is essential to safe jet aircraft operation. Today, all aviation fuels may be provided the ultimate protection against fuel contamination. The new Warner Lewis 2-stage separator/filter eliminates jet fuel contaminants — free water and dirt — and delivers the cleanest fuel ever demanded by commercial or military aircraft.

A Silent Servant of Safety, this equipment is installed on fueling facilities serving most of the world's major airports. It is approved and in production for the U. S. Air Force under recent contracts. For further information, write Aviation Products division, Warner Lewis Company.

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Operating Gains in September Reduce 'Deficit' Carriers to Three

Airline finances are beginning to show their rosiest outlook in months as September results pared the list of airlines operating at a deficit to only three.

With a total operating profit of $11.4 million for the month, almost a repeat of August performance, the nine-month profit figure for 1960 climbed to $27.2 million. Only National ($1.2 million), Northeast ($382,000) and Eastern ($4,000) had an operating deficit.

In operations for the nine months, five carriers (Capital, Eastern, National, Northeast and TWA) have a combined deficit of $20.4 million. The seven other trunks, led by American, United and Delta, show an operating profit of $47.6 million.

For the second successive month, United topped the trunks in operating gain at $4.7 million. Capital, now in merger proceedings with United, showed an operating profit of $117,000. At the present rate, TWA should move out of the red column for domestic operations with November's results.

Eastern, a heavy loser in the early months of 1960, came within $4,000 of the black side of the ledger in September and presumably will reach that goal with October's results. ■

ON-TIME BOXSCORE

JULY, 1960

Airline Ranking		On time to 15 min. late
TRUNKS		
1	Braniff	84.5%
2	Western	84.0
3	Capital	80.7
4	TWA	80.7
5	United	78.6
6	American	77.5
7	Northwest	73.3
8	Continental	73.0
9	Delta	71.1
10	Northeast	68.9
11	Eastern	67.2
12	National	45.5
707 AND DC-8		
1	TWA	71.2
2	Western	70.7
3	American	67.8
4	Delta	61.0
5	Continental	58.1
6	Braniff	55.4
7	United	41.3
8	National	33.3
9	Eastern	26.9
10	Northeast	9.5
CONVAIR 880		
1	Delta	20.8
ELECTRA		
1	Braniff	80.0
2	Western	75.3
3	American	73.5
4	Northwest	44.4
5	Eastern	43.8
6	National	17.2
LOCAL SERVICE		
1	West Coast	100.0
2	Piedmont	92.8
3	Central	91.3
4	Frontier	90.0
5	North Central	89.2
6	Ozark	85.8
7	Lake Central	84.2
8	Trans-Texas	82.5
9	Southern	78.0
10	Bonanza	70.5
11	Mohawk	66.5
12	Allegheny	66.3
13	Pacific	66.1

AUGUST, 1960

Airline Ranking		On time to 15 min. late
TRUNKS		
1	Western	86.5
2	Braniff	83.8
3	Continental	82.0
4	TWA	80.8
5	United	80.5
6	American	74.1
7	Capital	72.1
8	Eastern	68.3
9	Northeast	64.6
10	Delta	64.1
11	Northwest	61.5
12	National	47.4
707 and DC-8		
1	Western	75.3
2	Braniff	73.9
3	TWA	73.5
4	Continental	71.4
5	American	64.9
6	United	56.2
7	Delta	53.7
8	Eastern	27.4
9	National	24.1
10	Northeast	6.3
BOEING 720		
1	United	10.0
CONVAIR 880		
1	Delta	30.5
ELECTRA		
1	Braniff	88.0
2	Western	82.3
3	American	66.8
4	Eastern	59.5
5	Northwest	32.2
6	National	27.1
LOCAL SERVICE		
1	West Coast	97.6
2	Central	96.4
3	Piedmont	93.0
4	Frontier	87.7
5	Lake Central	85.8
6	Ozark	81.7
7	Pacific	77.4
8	North Central	75.8
9	Trans-Texas	74.7
10	Southern	74.2
11	Allegheny	70.7
12	Bonanza	69.5
13	Mohawk	59.6

Nine Months Finances

Here is the airline-by-airline rundown on results for September and for the year 1960 to date. Figures are in thousands of dollars and are for domestic operations only.

Airline	September	Year to Date
American	$4310*	$17,001
Braniff	506	2444
Capital	117	(5391)
Continental	478	4978
Delta	455	6580
Eastern	(4)	(6583)
National	(1222)	(4490)
Northeast	(382)	(2380)
Northwest	529	2810
TWA	1283	(1567)
United	4683	8745
Western	671	5062
Total	**$11,424**	**$27,209**

*Includes adjustment for earlier months. CAB interim report for Sept. shows profit of $3,548,000.

Coach Shows Fast Climb, 1st Class Continues Sag

Coach travel continues to climb rapidly while first-class sags, and overall domestic trunk traffic remains far below forecasts.

Coach for the first 10 months of 1960 shows a healthy 17.6% gain over the same 1959 period, with passenger-miles totaling 12.09 billion. Available seat-miles of 18.78 billion are up 18.9% and load factor is 64.37% against 65.06%.

The first-class picture is entirely different: passenger-miles down 4% to 12.75 billion, seat-miles up 1.3% to 22.4 billion. Load factor is down from 60.06% to 56.91%.

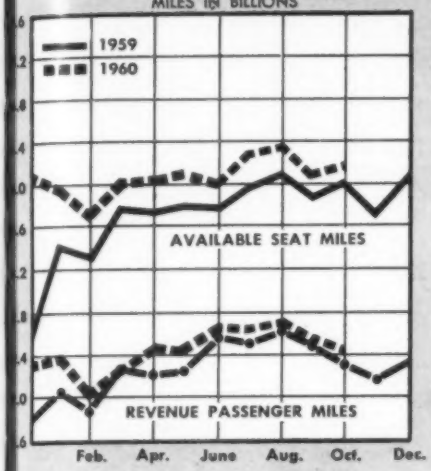
Overall totals for the 10 months are 24.84 billion passenger-miles, up 5.4%, and 41.17 billion seat-miles, up 8.7%. Load factor of 59.10% compares with last year's 59.27%.

With more business travel switching to jet coach, the lower-fare service comprises 48.7% of total traffic for 10 months against 43.6% last year.

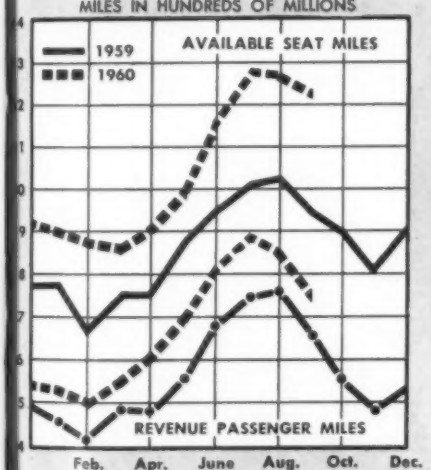
For October, coach registers one of its biggest jumps, up 24.8% from the same 1959 month to 1.21 billion passenger-miles. This outstrips the capacity gain of 19.9%, or 1.98 billion seat-miles, and increases load factor from 58.6% to 61%. Coach shows 48.5% of total, up from 1959's 40.9%. ■

HOW'S TRAFFIC
Among U.S. Airlines

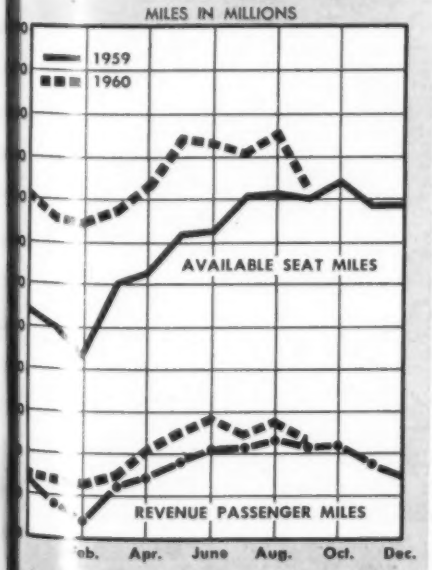
DOMESTIC TRUNKS
MILES IN BILLIONS



INTERNATIONAL
MILES IN HUNDREDS OF MILLIONS



LOCAL SERVICE
MILES IN MILLIONS



U.S. Airline Traffic for September
1960 vs. 1959

This complete summary compiled by AIRLIFT Magazine from Official CAB data.

	Revenue Passengers (000)			Revenue Passenger Miles (000)		
	1960	1959	% Change	1960	1959	% Change
DOMESTIC						
American	710	725	— 2.1	563,371	543,777	3.6
Braniff	189	179	5.6	92,495	79,544	16.3
Capital	311	343	— 9.3	125,788	139,058	— 9.5
Continental	117	108	8.3	77,029	71,264	8.1
Delta	277	248	11.7	144,403	121,006	19.3
Eastern	662	708	— 6.5	317,113	363,474	—12.7
National	125	130	— 3.8	68,825	72,919	— 5.6
Northeast	123	111	10.8	40,501	38,362	5.6
Northwest	168	165	1.8	121,792	127,693	— 4.6
Trans World	438	476	— 8.0	411,244	444,944	— 7.6
United	716	626	14.4	516,002	431,466	19.6
Western	136	153	—11.1	79,129	85,638	— 7.6
	3,972	3,972	....	2,557,692	2,519,145	1.5
INTERNATIONAL						
American	8	9	....	8,387	9,140	....
Braniff	6	4	50.0	11,393	8,165	39.5
Caribair	27	28	— 3.6	1,877	1,939	— 3.2
Delta	2	4	—50.0	2,850	5,523	—48.4
Eastern Overseas	40	39	....	58,446	60,674	— 3.7
San Juan	32	31	6.5	48,899	51,142	— 4.4
Bermuda	4	4	....	3,293	3,053	7.9
Mexico	4	4	....	6,254	6,479	— 3.5
National	3	6	—50.0	2,140	4,304	—50.3
Northwest	18	18	....	33,909	32,444	4.5
Panagra	10	12	—16.7	16,732	17,558	— 4.7
Pan American, System	302	272	11.0	503,363	444,678	13.2
Latin American	91	104	—12.5	112,440	122,761	— 8.4
Atlantic	163	133	22.6	228,440	191,643	19.2
Pacific	42	30	40.0	155,706	125,182	24.4
Alaska	6	5	20.0	6,777	5,092	33.1
Trans Caribbean	13	8	62.5	19,844	12,217	62.4
Trans World	39	42	— 7.1	123,774	130,015	— 4.8
United	17	11	54.5	43,298	26,822	61.4
Western	4	5	—20.0	5,533	7,811	—29.3
	489	458	6.8	831,546	761,290	9.2
LOCAL SERVICE						
Allegheny	67	55	21.8	13,663	9,593	42.4
Bonanza	22	19	15.8	5,296	4,630	14.4
Central	15	14	7.1	2,901	2,679	8.3
Frontier	30	28	7.1	8,127	7,239	12.3
Lake Central	21	21	....	3,338	3,357	— 0.6
Mohawk	56	50	12.0	11,307	9,853	14.8
North Central	88	88	....	15,781	15,806	— 0.2
Ozark	54	51	5.9	9,435	8,917	5.8
Pacific	44	43	2.3	10,099	9,847	2.6
Piedmont	42	43	— 2.3	8,838	9,114	— 3.0
Southern	21	20	5.0	3,765	3,589	4.9
Trans-Texas*	....	....	....	....	....	....
West Coast	34	33	3.0	8,342	7,683	8.6
	494	465	6.2	100,892	92,307	9.3
HELICOPTERS						
Chicago	29	23	26.1	485	414	17.1
Los Angeles	3	4	—25.0	116	144	—19.4
New York	12	12	....	259	218	18.8
	44	39	12.8	860	776	10.8
INTRA HAWAII						
Aloha	31	27	14.8	4,435	3,932	12.8
Hawaiian	44	37	18.9	9,216	5,389	71.0
	75	64	17.2	13,651	9,321	46.4
ALASKA						
Alaska	12	10	20.0	10,146	8,600	18.0
Alaska Coastal	6	5	20.0	623	579	7.6
Cordova	2	1	100.0	304	241	26.1
Ellis	6	6	....	380	375	1.3
Nor. Consolidated	2	3	—33.3	792	906	—12.6
Pacific Northern	12	11	9.1	11,147	10,561	5.5
Reeve				Not Available		
Wien	4	4	....	1,205	1,131	6.5
	44	40	10.0	24,397	22,393	9.8

ALL CARGO
(Ton miles in thousands)

	Freight			Total Scheduled			Total All Services		
	1960	1959	% Change	1960	1959	% Change	1960	1959	% Change
AAXICO				Suspended					
Flying Tiger	6,692,142	8,634,223	—22.5	6,787,165	8,510,208	—20.2	9,595,795	13,327,566	—28.0
Riddle	1,464,144	1,864,506	—21.5	1,519,758	1,902,365	—20.1	3,440,391	1,979,571	73.8
Slick	.....	.....	...	.....	.....	...	3,907,804	6,080,464	—35.7
Aerovias Sud					Not Available				
Seaboard & Western	1,976,704	1,772,681	11.5	2,955,386	2,179,423	35.6	5,154,298	2,362,483	118.2
	10,132,990	12,271,410	—17.4	11,262,307	12,591,996	—10.6	22,098,288	23,750,084	— 7.0

* No report due to fire.

COLLINS
COMPLETES
THE
PICTURE
The Collins AP-103 Automatic Pilot has been designed specifically to meet flight control requirements of the new jet transports being readied for service. Founded on two previous generations of automatic flight control systems, which already have demonstrated their superior reliability in airline use, the AP-103 joins a proud family of aviation electronic equipment. It accepts guidance data from all navigation aids in comfort, because of Collins command smoothing techniques.
And it is designed to integrate with any modern flight director system, an instrumentation concept pioneered by Collins and now adopted throughout the industry.
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AUTO PILOT
YAW DAMPER
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TURN
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Growth Stressed in Air Data Design

AiResearch system for air transports emphasizes 'universal' concept with proven building-block components

By RICHARD VAN OSTEN

AiResearch has reached deep into its big bag of experience with military-type air data systems and pulled up a simplified, lightweight version tailored to air transport requirements.

Described as a "Universal Central Air Data System" by The Garrett Corp. division, the unit's design leans heavily upon well-proven concepts and components.

The system's interchangeable, plug-in air data modules, Mach number and altitude sensors, servos, amplifiers and the like, are in production for air data systems AiResearch has developed for the McDonnell F4H Phantom II, North American A3J Vigilante, and Lockheed export models F-104G and CF-104.

Basic system hardware consists of a computer, two indicators and a total temperature sensor. A second computer and appropriate indicators can be provided for a co-pilot station. Weight of the basic system, including the computer channel, altitude and Mach indicators, is 17.1 lbs. The computer conforms to ARINC form factors and is packaged in the short 3/8 ATR specification.

Computer is basic

Heart of the system is the electromechanical analog computer which solves for basic shaft outputs of Mach number and altitude. Shafts are provided also for computation of optional outputs. The computer's servo motors have adequate torque to drive all basic outputs, correction functions, and optional outputs to insure an accurate and dynamically reliable system. Accuracy in Mach number is on the order of 0.006 Mach.

Altitude values are accurate to one-quarter of one per cent—equivalent to an error of approximately 100 ft. at 50,000 ft. with electrical display instrumentation. The single computer has capacity to drive two sets of altitude, Mach number and indicated airspeed indicators.

The term "universal" as applied to the air data system is probably best expressed in computer package design philosophy by which plug-in modules allow a complete selection of outputs from a single, basic computer pre-wired to cover all possible customer choices in options.

AiResearch maintains that penalties for providing unused space for growth and optional outputs are not great and are far overshadowed by a reduction in non-recurring cost, direct hardware costs, and costs of spares and maintenance. Moreover, this concept does not compromise basic computing operations in any way.

Three inputs necessary

The computer accepts three inputs: indicated static air pressure, total air pressure and total air temperature. Basic outputs of Mach number and altitude are derived from these. Mach number display is generated by a synchro transmitter output. Altitude display is generated by a dual speed synchro output, and a potentiometer provides signals for a flight recorder.

Plug-in modules, offered as options, include: true and indicated airspeed signals; static air and total air temperature signals; shafts for additional Mach number outputs; additional altitude outputs, inclusion of Mach hold outputs, inclusion of altitude hold output and Q_c outputs; and a cam for static pressure compensation.

Outputs for the above may be used for display or as signals supplied as inputs for a related system.

Indicated airspeed sub-system has two synchro transmitter outputs—one for display of IAS, the other for maximum allowable airspeed display. A third IAS output, a potentiometer, can be supplied as an input to the autopilot.

System design specifications call for all output devices used for display in altitude, Mach number and IAS subsystems to have sufficient capacity to drive two sets of displays so that either the pilot or co-pilot air data system computer can drive both display panels if required. The same specification is required also for altitude rate.

Displays for true airspeed and static air temperature are derived through one potentiometer each. Altitude hold outputs consist of one linear transformer (or synchro) and three potentiometers for use by the autopilot. Impact pressure outputs consist of six switches for pitch trim. A similar, six-switch, pitch trim approach is used for V_c or M_{ne} (Mach—never exceed) information.

A "full house" application of the AiResearch system would weigh about 22 lbs. and could supply the following functions from a central computer:

Mach—Switching, hold, display, M_{ne}, automatic trim, flight recorder or analyzer signals, cruise control and automatic flight control.

Altitude—Switching, hold, display, automatic trim, flight recorder or analyzer signals, traffic control and automatic flight control.

Indicated airspeed—Switching, display, V_{ne} (airspeed—never exceed), automatic trim signals, flight recorder or analyzer signals and traffic control.

Total temperature and static temperature—Computation of true air temperature and static air temperature for engine settings and cruise control.

True airspeed—Signals available for navigation and cruise control.

Impact pressure—Switching.

Static pressure position error compensation—Incorporation of this correction requires only the insertion of a plate cam with the applicable curve.

Maintenance simplified

Maintenance of the air data system has been given much thought. Elimination of multiple sensors for varied functions should reduce the complexity of maintenance with an accompanying reduction of maintenance costs. The centralized concept, in effect, places potential problems in one place if such problems are encountered. Plumbing and manifolding are reduced and interconnecting wiring minimized.

Use of plug-in modules to the widest possible extent in the basic com-

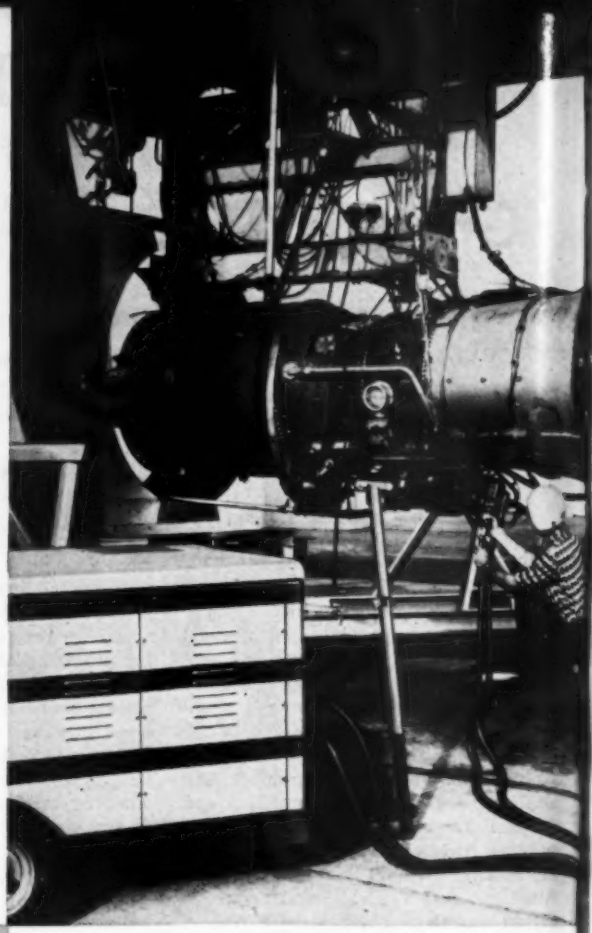
Continued on page 41

CAPABILITY
is spelled
h-y-d-r-a-u-l-i-c
s-t-a-r-t-i-n-g

In technology and facility, Vickers continually matches your need

Auxiliary power units pioneered for aircraft turbine starting by Vickers combine high efficiency with minimum size and weight for the power delivered. Because starter characteristics are closely matched to engine requirements, they provide smooth, steady acceleration of the engine through the firepoint range giving the best possible chance of proper "lighting off" and avoiding aborted starts.

Dual-purpose units developed by Vickers as an outgrowth of pioneering work in hydraulic starting offer further benefits in weight saving. These units are used as a motor in engine starting, as a pump to supply accessory power during normal operation. Reduced cost and ground support requirements plus increased versatility and simpler remote area operation are other major benefits. Write for Bulletin A-6001.



PROVED PERFORMANCE of hydraulic starting for jet engines is demonstrated by this cart that has performed more than 2,500 trouble-free starts in a 2-year period. Cart size is due to divergent requirements of three different engines. Prime mover power requirement is only 25% of that needed for other starting methods due to inherent high efficiency of the hydraulic transmission.

JET PROP STARTING demonstration uses engine-mounted starter motor and ground cart power supply. Starter cutout speed of approximately 8,000 rpm was reached in 34.5 to 40 seconds during series of observed test starts.

MULTI-PURPOSE PUMP MOTOR (left) is pump when driving hydraulic starter becomes motor during normal flight to drive 15 KVA generator. **HELICOPTER STARTER** (right) is 35 hp unit that starts 1,900 shaft hp engine readily.

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puter system also pays off in maintenance. All the plug-in units are precalibrated and interchangeable without calibration. Cams used in the static pressure correction sub-system are replaceable with positive indexing and a minimum of effort.

Reliability and maintenance cannot be completely separated. AiResearch predicts a system mean-time-to-failure of 2000 hours. This value is based upon known hazard experience with the same components in military data systems. Reliability is boosted also by the use of a simple electro-mechanical computing technique. Still another aid to reliability is in the use of de-rated components in comparison to the performance required of the identical components in a complex military air data system.

Self-test features are incorporated in the AiResearch air data system as well as visual alarm display in the event of failure. The system is so designed that failure of the altitude channel will not affect the Mach channel. Mach channel failure negates static pressure compensation only in the altitude channel.

Growth is 'built-in'

Growth potential is inherent in the system. Although the system's present operating envelope covers Mach 1.0 and 50,000-ft. altitudes, the de-rated pressure sensors are capable of operating over a Mach number range of 3.0 and altitudes of 100,000 ft. As pointed out earlier, many options are available, and the computer unit is complete—prewired to cover installation of such options.

The company is putting little emphasis on display methods, because "we're not trying to sell indicators," project engineers told *AIRLIFT*. Display methods are a well-known area of controversy among engineers, aircraft operators and aircrews. The AiResearch system is capable of handling just about any type of display an operator may require, but the company tends to favor electrical-type instrumentation which it says would provide the greatest degree of latitude and accuracy.

Electrical requirements of the data system are 115 v, 400 cps, 160 watts, at a power factor of 0.80 lag.

Now in the late development stage, the AiResearch system is scheduled for flight testing in the near future by Boeing and Douglas and by United and Eastern. It will not replace other equipment during the test program, but will be installed as auxiliary equipment and the results monitored. The four test units will have altitude and Mach information plus the optional indicated and true airspeed information. Both failure monitoring and self-test features will be incorporated in the development models.

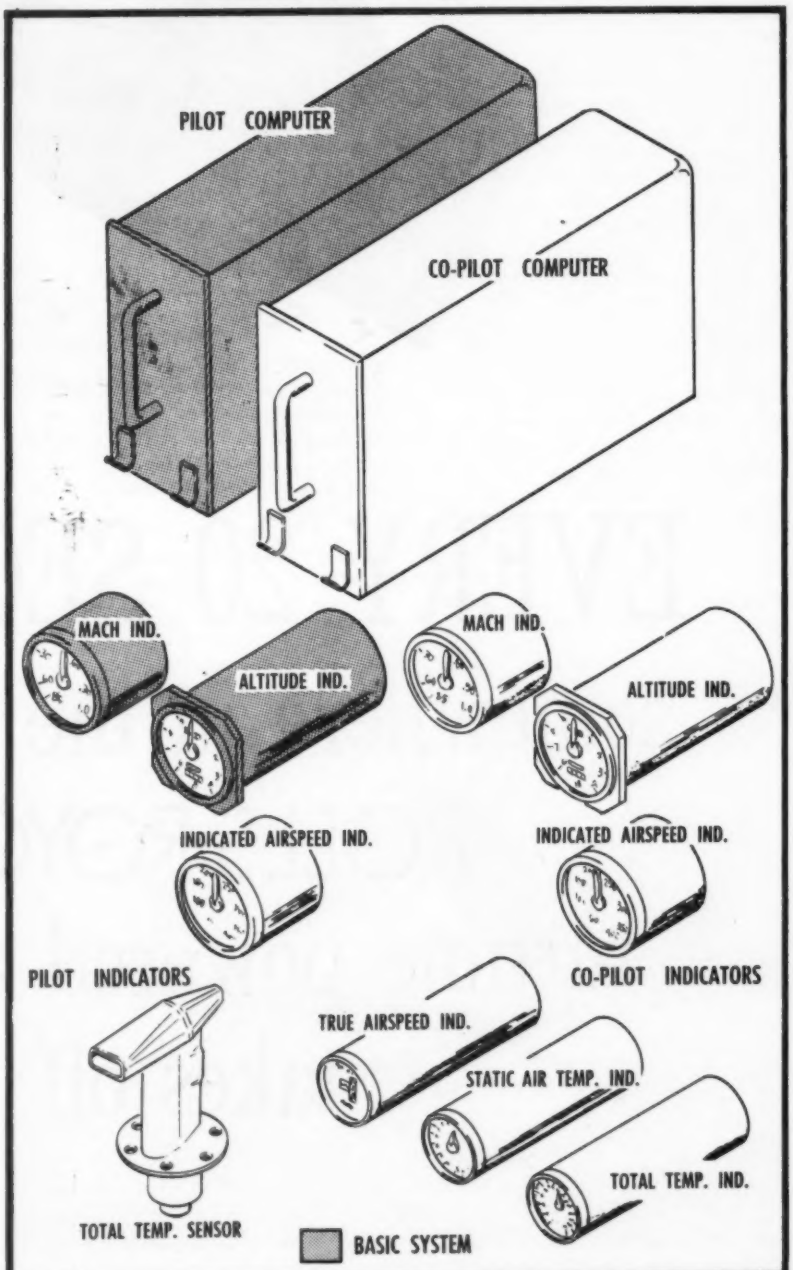
There is some thought at AiResearch that the 3/8 ATR package may be changed to a ½ ATR size. If the smaller unit can be maintained, however, it would offer the advantage of providing an operator with installation of a dual air data system as direct replacement of existing single systems in the ¾ ATR package.

It is a little early to set up a tight cost figure. *AIRLIFT* was told that final cost for a basic system will be between 20 and 30% lower than current comparable equipment, plus the new system will have the built-in capability of expansion.

About 10 years of air data system background has gone into the design, and the program has been completely company funded. The final system approach, however, is the direct result of a six-month study by AiResearch as to the exact needs of airframe manufac-

Continued on page 43

The AiResearch 'Building-Block' Concept



BASIC SYSTEM (shaded areas) could easily be expanded by addition of another computer plus comprehensive indicators for airspeed, temperature and altitude.

EVERY 20 SECONDS

somewhere in the world a ROLLS-ROYCE turbine powered airliner takes off

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turers as well as commercial airlines.

Analysis of the study showed there was reasonable agreement among those queried as far as general flight envelope and degree of accuracy for such an air data system was concerned. Principal variables appeared in the areas of display requirements, air data services to airframe subsystems, packaging and application to early, present and future aircraft models. Fortunately, AiResearch points out, the variations fell within reasonable boundaries.

The air data system has met with enthusiasm on the part of operators, the company says. Particular interest has been shown in the plug-in module approach and interchangability of modular units without complex calibration procedures. But, the company hastens to add, "we were told to put up or shut up, but we're not worried." ■

New Engine-Out Ratings A Must for Helicopters

Special engine-out ratings for turbine helicopter engines are a necessity if the full potential of twin-turbine rotorcraft is to be realized, according to Lee S. Johnson, president of the American Helicopter Society.

Johnson, general manager of Sikorsky Aircraft, said absence of the special ratings will reduce payload by 50 to 60 per cent.

Helicopter manufacturers, engine manufacturers, and the helicopter airlines have been working with FAA for nearly two years in an attempt to set up the special contingency rating system. Latest word is that FAA will approach industry with a formal proposal in about two months.

The contingency rating would work like this: A typical engine, such as the GE CT-58, now has two horsepower ratings, "takeoff" and "maximum cruise." To these would be added a "30 minute contingency rating" of a higher horsepower than takeoff, and (according to some proposals) a "2½ minute contingency rating" of an even higher value.

The additional ratings would permit much greater flexibility in emergency operations, and would have the dual effect of increasing payload and lowering weather minimums because of the added margin of safety.

"The use of special ratings, for which the engine has been properly tested to demonstrate reliability, will permit a more economic use of the aircraft and engine combination," Johnson said in a recent speech. He plugged for adoption of the ratings before twin-turbine craft go into operation early next year. ■

FAA Nearing Flight Stage With Jet for Navaid Checks

The FAA's new KC-135 airways inspection aircraft—which might be more accurately described as a flying electronics laboratory—is scheduled to make its shakedown flight December 15 at Oklahoma City.

The airplane, which replaces a B-57 previously used for high-altitude facilities inspection, will become operational on January 7. A second KC-135, now used for training of FAA personnel, will be modified for flight check work in late April.

A fleet of five Convairs is also being equipped for airways inspection by Airborne Instruments Laboratory, Div. of Cutler-Hammer, Inc. The KC-135s and the Convairs are designed to operate in conjunction with FAA's leased IBM 704 computer, which is housed at the Aeronautical Center in Oklahoma City.

The flight inspection installation in the first KC-135—N98—will consist of two consoles which each have capability for recording 36 channels of analog data. A positioning control panel will record 6 channels of digital data.

The aircraft will be capable of: (1) recording data from eight VOR ground stations and monitoring two additional stations, (2) recording data from four TACAN stations and monitoring two additional; (3) recording data from one ILS system; (4) recording distances to four ground stations for aircraft position fixing, and (5) making radar, procedural and miscellaneous inspections. Data will be available 24 hours after completion of the flight.

The jet will carry a pilot supervisor, two pilots, a flight maintenance technician, and three electronic technicians. Its average flight will be eight hours, and its minimum operational altitude will be 24,000 feet. Both KC-135s will be based at Tinker AFB in Oklahoma City, and will operate exclusively from SAC bases, according to FAA.

The modification was described as "very complicated," due primarily to the fact that the majority of the plane's antennas are located on the belly directly below the fuel cavities.

The big jets were purchased from the Air Force for $2.5 million apiece. FAA said no figures are available on cost of their electronic gadgetry, since they will be equipped initially with "second-hand" devices. After sufficient operational experience is gained, some equipment will be modified or replaced. ■

FAA Photo.

AIRWAYS INSPECTION will be the job of FAA's new KC-135, which goes into service January 7. A second KC-135 and five Convairs are also being modified.

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Tests Uphold 'Area Control' Concept

Chicago/Indianapolis 'Operation Pathfinder' assays area positive control of upper altitude airspace

By BRAD DUNBAR

FAA has a flying start on what could well prove to be the most significant new air traffic control method since jet routes—positive control of all high-altitude traffic in a large area rather than just narrow transcontinental airways.

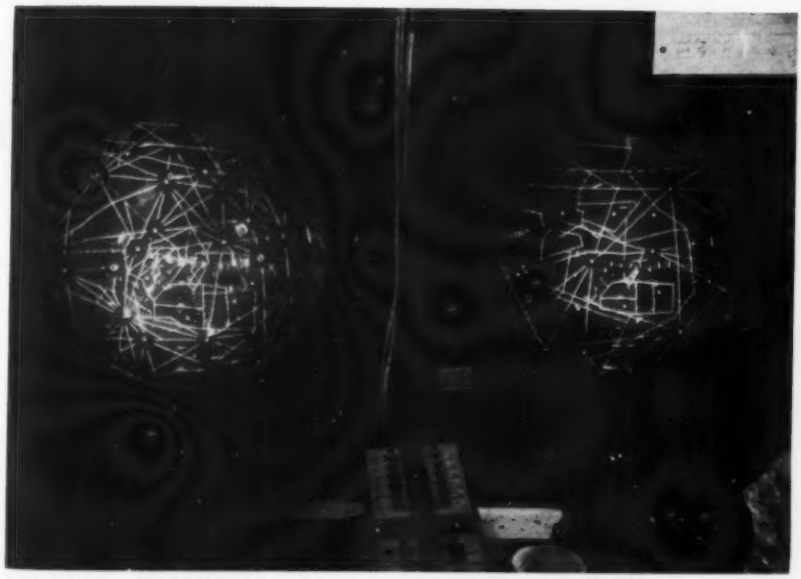
Almost without incident, it has established positive control between Flight Levels 240 and 350 inclusive over a 110,000-sq. mi. area spanning eight midwestern states. Within this big chunk of upper airspace—thanks to augmented radar, communications, radar beaconry, reinforced staffs and new positive ATC techniques—it is successfully separating en route 707's and mission-bound B-52s, scrambling F-106s, and instrument-check "T-birds," a lonesome Gulfstream and a "hot" ARDC test hop.

The first fruit of long CAA/FAA planning, "Operation Pathfinder" was put into effect Oct. 15 by the Chicago and Indianapolis Air Route Traffic Control Centers with a quiet confidence that it would meet its schedules and thoroughly test the broadened ATC concept without major difficulty. In just its first 30 days, it has met or exceeded its implementation schedules, and gone far toward demonstrating area positive control as a promising answer to some of the industry's near-future needs—particularly in high density areas within the old Golden Triangle.

Only one "near-miss." There has been, in fact, only one incident in the Pathfinder air-space at this writing, and Indianapolis Chief Jack Wubbolding points out that it in no way was caused by special Pathfinder techniques or equipment. A climbing B-52 pilot reported a "near-miss" in which he said he passed within two miles of an en route American Airlines 707. The AA pilot did not consider it a near-miss; the controller involved conceded that the horizontal radar separation he had expected had turned out to be less than the required five miles.

Here, in summary, is the picture of the test at the 30-day mark of a

Continued on page 47



VERTICAL "BACKUP" SCOPES are extra pathfinder tools. These varying-range bright displays of remoted London radar supplement horizontal Indianapolis radar.

FAA Photos.

HEART OF NEW POSITIVE ATC technique is this three-controller team—"manual" (flight strip) man, radar-radio man and tracker. Behind stands a sector coordinator.

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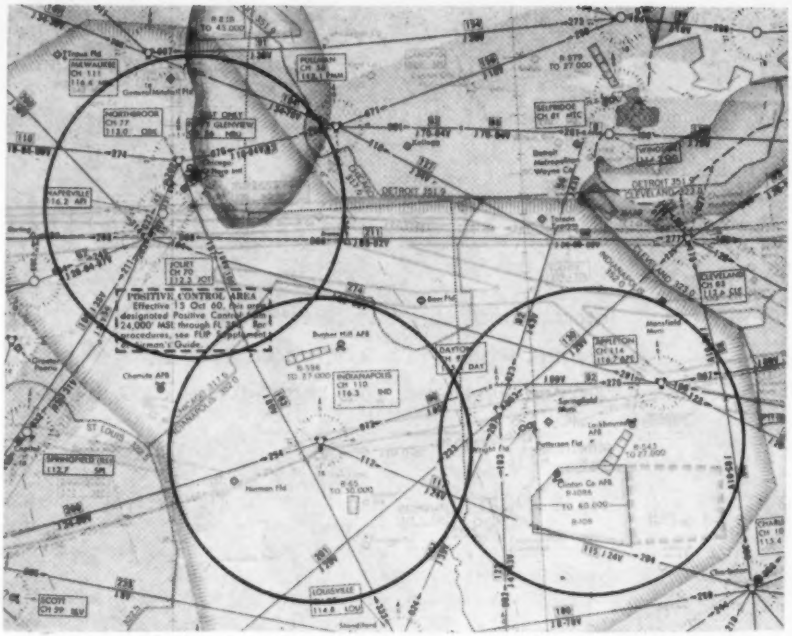
roughly six-month program:

The "test bed." High altitude airspace bounded roughly by 125-mile range marks of the three ATC radars at Chicago, Indianapolis, and London, Ohio, handled by eight ARTC sectors —four at Chicago and four at Indianapolis. Three-man controller teams man each sector, equipped with primary and backup bright radar displays, modified Selective Identification Feature (SIF) radar beaconry, discreet VFH and UHF frequencies for direct and sure ground-air communications, and new training and techniques.

Planes, pilots, and rules. They handle all civil jets—all of Chicago's jets; Indianapolis, for example, covers ADC interceptors from Lockbourne and Bunker Hill AFBs; SAC jets from these fields and Wright-Patterson; ARDC test flights from Wright-Pat; Air National Guard from a half-dozen fields. Even one of SAC's "oil burner" corridors sends its jets up into the Pathfinder airspace after a radar bomb scoring run on the Lexington, Ky., RBS. There'll be an occasional executive Gulfstream. But all traffic is IFR, or has prior ATC clearance; all aircraft have functioning radar beacon transponders, IFR flight instruments and adequate radio; all pilots are fully instrument-qualified. Techniques include temporary airspace blocks in "local flying areas" for test flights and other hard-to-control traffic.



FAA BUILT POSITIVE CONTROL area along these 125-mile range marks from Chicago, Indianapolis, London (Ohio) radars. Grey "picket fence" is Pathfinder boundary.

The traffic. Comparisons and exact peak days are difficult to determine from only 30 days. But a representative busy day, Oct. 28, counted 837 Pathfinder airspace operations, 507 handled by Indianapolis and 330 by Chicago. A total of 783 was counted in the same airspace on Sept. 20 before the test began. Peak day for the whole Indianapolis center has been 521, about 400 of which represented Pathfinder traffic.

Whatever the figure, clearly increased traffic loads are being handled within capacity, with peak loads so far "strictly no strain." ■

INDIANAPOLIS CONTROLLER selects code for "ident" by unknown aircraft.

MANY U.S. HIGH-ALTITUDE sectors now monitor traffic by radar; Pathfinder controllers direct everything that flies between altitudes 240 and 350 above them.

Spares Pools Trim Inventory Costs

International carriers are discovering the savings which parts pools can bring through reduced overhead, cost sharing and convenience

By ANTHONY VANDYK

More and more international airlines are discovering savings in spares pools participation. Air France and KLM saved some $1 million each in spare parts cost by setting up an L-1049 spares pool in 1954. The whopping savings available to Boeing 707 operators are shown on the accompanying table.

Spares pools are based on aircraft type and involve a multilateral agreement between participating airlines. Neither IATA nor manufacturers are involved.

Pool agreements spell out which airline is to act as "provider" and where. The provider must keep at the disposal of all pool members a stock of spare parts, engines, ground handling equipment and ground maintenance equipment. Items and quantities are subject to review every six months.

An airline generally acts as the provider at its home base. For example, BOAC is the 707 provider at London Airport while Air France does the honors at Paris and Sabena at Brussels. Other stations are distributed among all members. In the 707 pool, Air France is provider at Mexico City, Qantas at Jakarta, Pakistan International at Beirut and Air-India at Geneva.

Items must be returned

In operation, any item borrowed must be returned to the provider's main base as soon as possible.

Suppose, for example, that Sabena has to replace a 707 generator (value $2,100) at Teheran. The provider there is Air France. The new generator from the Air France store is fitted to the Sabena aircraft, while a message is sent to Air France headquarters in Paris ordering a replacement generator for the Teheran provider's stock.

As soon as the 707 returns to Brussels the generator fitted in Teheran is removed and one from Sabena's stock is substituted. The removed generator is then sent to Air France where after examination it goes into the stockroom in Paris.

In most of the pools there is no charge for borrowing a spare part. The airlines share the cost of setting up the pools and each member can use them as much as he wishes.

For engines there is sometimes a hiring charge debited to the provider on a daily basis for the duration of the loan plus an hourly charge for the time the engine was actually operated.

Costs shared equally

Normally, costs of spare parts, tools, engine and ground maintenance equipment at pool stations are shared equally by participating airlines. Ground handling equipment is paid for on the basis of equal division for one-third and on number of landings for the remaining two thirds. The "availability charge" is computed on a weekly basis with a five year depreciation factor for airframes and seven years for engines applied to the manufacturer's list price.

If a borrowed unit cannot be returned to the provider or replaced it usually must be purchased. One pool sets the price at list plus 25%.

Before an airline can join a spares pool it must have FAA approval of its overhaul facilities. This is required by all certification authorities. Without FAA approval as a common standard, the certification authority for each airline would have to approve the overhaul facilities of all the other airlines in the pool.

The pools carry everything from screws to complete powerplants. They do not include "insurance items"—major pieces which would only be needed as a result of an accident. These are kept at the bases of the pool airlines. There are also central European emergency stockrooms set up by Boeing and Douglas. Airlines soon may be able to borrow rather than buy from these spares depots.

For European operators the spares pool has become an essential activity. There are pools for just about every type of aircraft used by European airlines.

DC-6B pool successful

The most successful pools are those in which the members have the same type of aircraft. One of the most successful—and one of the earliest—was the KLM, Sabena and Swissair agreement on the DC-6B. Air France and SAS Caravelles are almost identical and thus lend themselves well to a spares pool. On the other hand, many configurations of Viscount are used by European operators and pool arrangements for this aircraft have not been successful. ■

BOEING 707 POOL AGREEMENT

Summer Season 1960

AIR FRANCE	BOAC	PAA	TWA	QEA	AIR INDIA	LUFT-HANSA	SABENA
Spares Provided							
$655,434	$454,107	$865,788	$588,139	$483,966	$32,154	$152,810	$78 318
Spares Shared							
$2,060,430	$617,799	$2,475,609	$1,443,402	$1,517,476	$774,540	$597,476	$480 089
Percentage of Spares Provided to Spares Shared							
31.8%	73.5%	34.9%	40.7%	31.8%	4.1%	25.6%	16.3%

Could you pick the guilty part?

Professional crime-busters say there's no such thing as "looking like a criminal." And it's much the same with replacement parts. A bargain-price substitute often resembles the original so closely that even a master sleuth would be hard put to find a single clue to prove the difference. But it doesn't take your engine long to detect any hidden weakness. And right then, instead of saving money, you may face charges for costly major repairs.

The best solution is always to specify original equipment parts for your Pratt & Whitney Aircraft engines. You can count on their quality. It's assured by precision processing and rigid quality controls. Through research, refining and testing, they are constantly improved to match the requirements of improved engine performance. Without access to these improvements, no substitute is likely to measure up to the high standards of dependability engineered into Pratt & Whitney Aircraft engines.

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ABOUT PEOPLE

RUDDICK

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IN THE AIRLINES

Robert M. Ruddick, v.p. and asst. to the president of United, assumes direction of the company's community relations and publicity activities, transferring from Washington to Chicago.

Robert E. Delany, who has been v.p. and general counsel of Icelandic Airlines, named president, succeeding **Nicholas Craig,** retired.

M. Lamar Muse, former secretary-treasurer of Trans-Texas, appointed asst. v.p.-planning of American. He will cover long-range corporate and financial planning.

A. M. Firestone, who has been American's director of properties, named director of real estate in the properties and facilities dept. **R. Allan Mills,** former aviation director of Portland, Ore., named director of airport properties. **John Kubik** promoted from Milwaukee city mgr. to mgr. of field performance appraisal in the passenger service dept.

M. V. Hellerstedt named administrative asst. to the v.p.-operation of Aloha, and continues as supt. of communications.

Raymond J. Wadsworth, former Indianapolis sales mgr. of Eastern, appointed asst. v.p.-sales of Alaska Airlines.

Guido Vittori promoted by Alitalia from North American public relations mgr. to asst. to the gen. mgr.-North America, a new post. **Joseph Le Tourneau,** press officer, succeeds Vittori.

Lawrence L. Stenzel, partner in the law firm of Hale, Stimson, Russell and Nickerson, general counsel for Allegheny, elected secretary of the airline. **Peter Brennan** elected asst. secretary and continues as public relations director.

Erik Palsgaard, management executive trainee in SAS' North American officer, becomes passenger sales mgr. of the company, based in Stockholm.

Robert L. Borgerding promoted by North Central from Willow Run station mgr. to eastern region supt. of stations; **Kenneth L. Hubertus** from Chicago mgr. to central region supt. of stations.

National Airlines reorganized its sales department on a divisional basis, with the following division heads: **Robert E. Wieland,** northern; **Robert A. Roe,** southern; **Melville S. Smith,** central east coast; **Thomas A. Provost,** western.

AMONG THE SUPPLIERS

Friedrich L. von Doblhoff, former international engineering director of Boeing's Vertol Div., named engineering director-Europe of Boeing, based at Vertol headquarters, Bad Godesberg, Germany.

Marion Maxfield, former director of F-27 sales for Fairchild, joins Vertol as new manager of commercial programs.

Gene L. Meyer appointed midwest aviation sales mgr. of AC Spark Plug Div. of General Motors.

John B. Montgomery resigned as v.p. and gen. mgr. of General Electric's Flight Propulsion Div. to become president of Daystrom Inc. **Thomas Roy Jones,** former president, named chairman and continues as chief executive officer.

J. T. Dresher, former v.p.-finance and treasurer of Hiller, elected v.p.-finance of Fairchild Engine & Airplane Corp.

Fred A. Twomey named mgr. of avionics products at Industrial Products Div. of International Telephone & Telegraph. He will supervise the development and marketing program in the general aviation equipment field.

Charles Nicholas named asst. director of Texaco's aviation sales dept.

Harlan Ray, former president of South west Airmotive, elected board chairman; **Winston Castleberry** advanced from executive v.p. to president of the service div., and **George Jalonick** from executive v.p. to president of the distribution div.

Other promotions at Southwest Airmotive: **B. W. Jackson,** operations director; **W. F. Gallemore,** commercial sales mgr.; **Gerald Coke,** dealer sales mgr.; **Richard S. Seger,** merchandising director; **Paul Ivey,** technical sales mgr.; **M. A. Barbettini,** sales director.

Paul W. Holt, Sikorsky controller, named asst. gen. mgr-programs. **Leete P. Doty** becomes asst. gen mgr.-operations.

W. L. Whittier appointed works mgr. of Douglas-Long Beach, and **Howard W. Cleveland** named manufacturing control mgr.

IN THE AGENCIES

George W. Haldeman named special asst. to director of CAB's Bureau of Safety. He was with CAA 20 years, later was technical asst. to the president of National in charge of jet aircraft procurement and evaluation.

E. K. Arnold, former economic director of Airport Operators Council, appointed asst. to the director of FAA's Bureau of National Capital Airports, in charge of airline negotiations.

L. W. Burton, former acting director of FAA's Bureau of National Capital Airports, returned to the agency as director of Washington National Airport, a post he previously held. Burton left FAA to become aviation director of Ft. Worth but decided not to take the job because of his family's reluctance to relocate.

FAA appointed the following asst. regional mgrs.: **Donald G. Schuler,** Ft. Worth; **Kirby L. Brannon,** Kansas City; **Robert T. Williams,** Anchorage; **Charles J. Winger,** Los Angeles.

OTHERS IN AVIATION

Gordon M. Bain, who resigned in August as Northwest Airlines' v.p.-sales, named executive v.p. of SITA World Travel, tour operators, Rancho Mirage, Calif.

Eugene Phillips resigned as Delta's information director to become deputy information director of Aerospace Corp.

Alvin Beck, who has been executive v.p. of Air Express International, air freight forwarder, elected president. **Chester M. Mayer,** who was president as well as chairman, continues as chairman and chief executive officer.

AIRLIFTS

• **Can-you-top-this-**department: TWA's Idlewild station says it loaded 564 passengers in one hour and 15 minutes, including domestic and international, jet and piston flights. And the Chicago-O'Hare station turned around a Boeing 707 in 24 minutes—boarded 76 passengers, 1,802 lbs. of cargo and pumped in 9,110 gallons of fuel.

• **Eileen Bailey was** somewhat put out when United Air Lines informed her that it just absolutely couldn't hire a woman mechanic. So she became a stewardess, and she's probably the only one who can: (1) disassemble, repair and reassemble a piston engine of more than 1,000 parts, (2) plot a course for a large aircraft on a transoceanic flight, (3) prepare meteorological data for a flight, (4) radio instructions from an airport control tower. Eileen is British and got her experience during a four-year hitch in the Woman's Royal Naval Service (WRENS). She doesn't have a very high regard for American women's mechanical ability. "Why, the average one won't even lift the bonnet (hood) of a car and take a look," she sniffs.

• **Credit for the following** "Immortality Road Ode" goes to Stanford Gwilliam, of L. G. Balfour Company's New York office:

Man once felt sure his soul would soar
On wings to the Celestial Shore,
Now, I suppose, he goes to Heaven
By turboprop or DC-7.
A jet-fired soul (if just and meek)
May get to God within a week;
While winged ghosts launched 10 B.C.
Are winging yet, it seems to me.

• **Jet travel is causing** new problems for hotels. Sig Front, director of sales for the air-minded Beverly Wilshire Hotel in Beverly Hills, Calif., says the average customer stayed 5½ days before jets, now stays only 3 days but comes oftener. But handling more customers who stay fewer days actually costs hotels more. In Chicago, he says, customers who used to stay at least one night, usually two, now don't even stay overnight with faster and

more frequent air service. Front says jets are forcing hotels to re-study their problems, especially on weekends.

• **A Western Air Lines ad** in a Los Angeles newspaper charted the following timetable: 9 a.m., hot breakfast flight to Seattle; 9:10 a.m., jet-powered luncheon champagne flight to Seattle; 5:30 p.m., jet-powered dinner champagne flight to Portland; 7:10 a.m., jet-powered breakfast flight to San Francisco; and so on down a list of 14 departures. Far seeing readers visionized that travel agents of the future may ask prospective passengers for their choice of roast beef or baked ham, then route them via the airline which can come up with the proper cuisine.

• **Dollar saving double-up** of the month—press release photo from Hawkes Aviation, Inc. (Sky Harbor Airport, Phoenix) bore, instead of the customary "Photograph from the office of . . ." on its back, the following blue-inked inscription: "Pay to the order of Valley National Bank, Phoenix, Arizona. For deposit only, Hawkes Aviation, Inc."

• **Saudi Arabian Airways,** checking into the possibility of using home-town hostesses, received this enlightening reply from the Grand Mufti: under existing religious rules, Saudi Arabian girls employed as hostesses must be accompanied on all flights by their fathers, sons or brothers; must wear veils outside the aircraft; must have, as chaperones, persons more than 21 years old "so they may appreciate their grave responsibility." The airline's decision: continue recruiting Lebanese and United Arab Republic girls whose chaperone requirements are less cumbersome.

• **Taxiing toward the runway,** the pilot of a non-sked DC-3 heard the tower crackle in his headphones: "There's somebody running after your aircraft." "If it's another passenger," he grumbled back, "he better trot back and wait for the next flight—we don't have any more room." "Negative," came the reply, "Appears to be your co-pilo " *(ATC Journal)*

• **An AIRLIFT staff member** hoping for a snooze after a near-midnight depar re reported with dismay the follow g consumption of early-morning cuis ne: 2 slices ham, 1 slice roast beef, 2 sl ces white bread, 2 slices wheat bre d, 1 hard-boiled egg, 1 package crac ers, 1 slice cheese, 1 radish, 5 sma l sections fresh pineapple, 5 section artichoke heart (in oil), 1 piece of pie!

Government Support Assured For Supersonic Design Study

British Aircraft Corp. wins grant of $980,000 for critical analysis of the SST problem

By MICHAEL DONNE

THE MOST SIGNIFICANT EVENT in British transport aviation over the past few weeks has been the government's decision, through the Ministry of Aviation, to award a $980,000 contract to the British Aircraft Corp. for a detailed design study for a supersonic airliner.

The decision is important for several reasons. First, it effectively demonstrates the government's recognition that the supersonic transport, when it comes, must be financed largely by government money, since its expense (estimated at between $140 million and $280 million for building a prototype) cannot be met entirely by the aircraft industry out of its own resources.

Second, it implements the government's tacit promise to the aircraft industry that it could expect a measure of state support on important future projects as the reward for obeying government insistence on rationalization and reorganization within the industry.

At the time of the big mergers among the aircraft companies, near the end of 1959 and early 1960, which resulted in the creation of the British Aircraft Corp. itself, the supersonic airliner design study contract was one of the "carrots" dangled before the industry's eyes. Now the "carrot" has been awarded, and the government can be regarded as having given some evidence of its good faith.

Early start guaranteed

Third, the contract ensures that the British aircraft industry can get started in a big way on the supersonic transport research program in sufficient time to insure that it will not be left behind competitively in the late 1960s when this type of airliner becomes the subject of airline purchasing decisions.

What precisely does the contract mean? In the first place, it must be stressed that it does not mean that the British government has taken a final decision on the development and construction of a prototype supersonic airliner.

The contract means just what it says, a "detailed design study"—enabling BAC to proceed with the necessary extensive analysis of speeds, shapes and structures, as well as power units, to determine the best possible combination for eventual production. It is possible that BAC may prepare more than one design study, or variants of a particular study, for consideration by the government.

The work is likely to take at least a year to complete. While technicians and engineers will be working on the practical aspects of the design study, the BAC's sales and other staffs will be canvassing the opinions of the airlines, and the views of the other major world aircraft manufacturers, as to the type of supersonic transport they would most like to buy and build.

Seek foreign cooperation

One of the prime conditions of the contract is that the BAC should endeavor to seek ways and means of cooperating with foreign manufacturers in the construction of such an airplane.

The argument in Britain is that the market for the airplane will be so small, in comparison with the market for other types of transport, that it would be better to build it in cooperation with foreign manufacturers, and share the development costs and the market, rather than to go it alone in tough competition with French and American manufacturers.

It is only when the design study has been completed, possibilities of international cooperation have been examined, and when the detailed assessment of development and production costs has been drawn up that the government will make the decision to go ahead.

It is still possible that the government may decide the project is too expensive and abandon it. Britain is not yet committed to building hardware, and may never be. But, at least for the time being, there is an apparent willingness to consider the project seriously, and to back the next stage of it with hard cash.

What sort of airliner has the British Aircraft Corp. in mind? Officially, it is not saying, but Sir George Edwards, the executive director in charge of aircraft development for the corporation, has made it clear that 1,500 m.p.h. is the most sensible and practicable speed at which to aim, the 2,000 m.p.h. transport being too difficult to contemplate at this stage. ■

ALPA Promises Tougher Bargaining

By J. F. LARSH
Contributing Editor

Convention planning—ALPA took positive steps at the November convention to strengthen its bargaining position. Managements are going to be faced with strong pilot determination to obtain industry recognition of the fact that they are the only professional people in the U.S. whose careers are terminated not by competence, but by Federal law (age 60).

A tough round of negotiations regarding this and working conditions can be expected to start immediately. Quotes from material prepared by different pilot groups illustrate the thinking management will face at the bargaining table:

"In the last decade the U.S. has made unprecedented gains in prosperity and living standards. The airline industry, having made tremendous gains in size, in importance and in economic strength, is obviously a 'growth industry.' Despite favorable factors of a prosperous economic climate, a strong and growing industry, and our own position of inherent strength, air line pilots have failed to translate their increases in productivity into suitable economic rewards for themselves.

"Today the payload capability of jet aircraft is 21 times that of the DC-3. Over the past 15 years too little of this 2,100 percent increased payload capability has been applied to the benefit of the pilot group in the form of lowered working hours.

Hours longer today—"Jet pilots today, faced with tremendous responsibilities, actually work longer hours in terms of on-duty time, and time away from home than they worked 15 years ago. The lag in having this increased technology applied to reduced working hours is contrary to the general character of the labor movement in the U.S.

"It has unfortunately resulted in increasing pilot unemployment and in dangerously excessive pilot workloads.

"With the speedup of the B-70 program the possibility exists that aircraft with 40 times the payload capability of DC-3 equipment may be operational within five years, leading potentially to the loss of possibly 50 percent to 75 percent of all pilot jobs.

"The concern that exists today with whether a pilot should be allowed to work past the age of 60 may well be replaced by the consideration of the problem of how many will be working tomorrow at the age of 50 or 45.

"We must grasp the implications of this increasing technological development and must alert our membership to its inherent dangers.

"A definite deterioration in working conditions has taken place.

(1) A substantial increase in the time spent away from home to accumulate flight credit pay up to 85 hours maximum, resulting in substantially more working days per month.

(2) Inadequate provision for rest between flights both at home base and lay-over points.

(3) A real question as to whether the 85-hour requirement, as applied to jet flying, is not in excess of the appropriate physiological and psychological strain that should be placed on flying personnel.

Schedules need reexamining—"But this is not all. The realism of existing schedules must be re-examined. If, in fact, on some airlines they require some 25 or even 30 working days, statistics as to the amount of credit flying time versus actual flying time are meaningless.

"Indeed, the ideal to be aimed at is schedules that reduce credit flying time adjusted to a reasonable maximum of actual flying time, which also will preserve pilot flying pay at levels presently existent or increased by cost-of-living requirements and other factors.

"Among these other factors . . . the jet is a more critical airplane than those hitherto encountered. Flying hour maximums for pilots handling such a plane must be re-examined in the light of all available evidence and not swept under the carpet . . .

"The degree of pilot attrition that jet flying may involve is, perhaps, still not measurable but may have serious consequences in the premature aging of pilots.

"All this points to the desirability of a reduction in the 85 hour maximum during this uncertain transition period. It also points to the necessity of re-examining schedules of propeller-driven airplanes which are now being relegated to essentially short-haul operations.

"These schedules also appear to be subject to a similar stretching out of the working days required to bring pay levels under the 85-hour concept up to what pilots previously have been able to earn.

Local service airlines—"Any cursory review of local service operations will show significant differences between those operations and comparable operations of trunk lines. The differences have an effect on wages and working conditions.

"Pilot pay for equivalent service is below that prevailing on trunk lines, despite the fact that the subsidies payable to these airlines would justify, at no cost to them, equivalent pay scales.

"Conditions also vary. The eight hour rule as applied to a trunk line schedule with two or three intermediate stops has a wholly different impact when applied to a local service operation with 10 or more intermediate stops, especially when many of them may have to be made under instrument conditions.

"The time has come when these should be examined and a course of action projected to deal with them. A special committee should be assembled to deal with this growing phase of pilot problems."

FAA—Many pilots will rejoice to hear that General Quesada is taking up baseball. But his departure from the FAA will not correct the basic source of complaints—only Congress can do this by amending the law to provide for review of FAA decisions. Perhaps James M. Landis in his recommendations for changes of the government regulatory agencies will be able to set the stage for the necessary changes.

Skid control—One of the big problems facing all pilots, particularly in jets, is skid control on wet and icy runways. Due to inadequate friction, a cross wind or unsymmetrical reversing can start a skid that may be difficult to control. This problem has received considerable study in regard to wet runways. A wet film only a few mils thick will allow a tire (with brakes locked) to actually aquaplane at speeds of over 100 mph.

Statistics—We sometimes forget how big our industry is getting. Let's take a look—there are 380,000 active licensed pilots in the U.S.; 64.2 percent are private pilots, 24.5 percent commercial pilots and 4.2 percent hold ATR's.

Jets Foster New Overhaul Thinking

By JOSEPH S. MURPHY

The jet engine, already a fantastic performer by piston standards of reliability and still getting better, is opening the door to entirely new concepts of airline engine overhaul.

This is the prospect advanced by Pan American's jet overhaul superintendent, Martin W. Taylor, whose shop turned out its 300th jet engine last month.

Taylor's "pet theory" on overhaul is, in effect, a broad extension of the hot and cold section approach to jet overhaul already accepted as approved practice. It would lead to adoption of an equalized service for the engine and its major components in place of the present complete teardown and reassembly.

If, says Taylor, the jet TBO (time between overhaul) begins to falter, we can replace the trouble section with an overhauled assembly in order to get other time increases.

The engine could easily be divided into eight major components—inlet case, N1 compressor, N2 compressor, accessory case, diffuser case, low speed turbine, high speed turbine, and exhaust case. Records could be kept of each section and controlled by serial number.

Instead of a single engine by serial number, the jet would become eight major components flying together. Periodic visits to the overhaul base would involve changes only in those assemblies requiring overhaul.

Changes when due

The engine shop, instead of tearing down and building up complete engines, would become a job shop feeding the eight assemblies to a service group that would change them as they became due for overhaul.

Pan Am's experience with P&W JT3s and JT4s amply supports Taylor's view of great growth potential in expanding overhaul times.

Since start of operation in Oct. 1958 through Sept. 1, the carrier removed 990 engines. Of these, 85% of the JT4 replacements and 81% of JT3s were planned either for overhaul, hot section inspection, or convenience.

Major Removal Causes

Of some 22 reasons for jet engine removal, eight sources of trouble accounted for 50 removals in Pan Am's operation:

P & W JT4

Cause of Removal	No.
Inlet guide vane cracking	15
Rotating assy balance	6
Diffuser case cracking	5
Bearing seal failure	4
Total	30

JT3

Turbine seal erosion	9
Compressor balance	5
No. 4 bearing failure	3
N2 Accessory drive gear	3
Total	20

Of the remaining premature changes (about 17%) all were repairable. One-third of the premature removals required no repair. For Pan Am's entire operation, amounting to more than 420,000 engine hours, 707 JT4 premature changes average one each 2,600 hrs., DC-8 JT4s one every 3,260 hrs. and 707 JT3 one every 1,800 hrs.

The jet, says Taylor, adapts itself to a short shop cycle. Pan Am is now on a 16-day cycle based on two shifts but is now moving to 14 days. With both steel and titanium JT4s for Boeing-321s, -331s and DC-8s plus the JT3s, the shop turns out 29 different powerpacks for jets.

Average manhours per JT4 powerpack is 1,620 or an estimated 850-900 for the bare engine. Within the next year Taylor expects this will drop to 1,200 manhours.

Pan Am's inventory to support eleven overhauls per week on a 16-day cycle is $3,470,000 with another $2,050,000 on order. In Sept., usage amounted to $550,000 or slightly more than 15% of inventory value.

Taylor lists vibration as the No. 1 JT4 problem to lick. Of 598 engine test runs by Pan Am, 18 have been rejected for inlet vibration, 11 for turbine vibration and two for other vibration. Only three engines were rejected for other causes.

In addition to these rejects, 15 707-JT4s were prematurely removed due to inlet guide vane cracks and six others for vibration. P&W has formed a team to tackle the problem and "live" at Pan Am's base until a fix is found.

The P&W jets are not the only ones enjoying remarkable in-service reliability records. According to J. R. Nutter, Rolls-Royce's chief service engineer, the R.Co. 12 jets operated by six airlines between April 1 and August 31 flew 73,348 engine hours without a premature removal requiring complete overhaul.

Only two engines were removed and repaired in the field and 32 others were removed and repaired in the overhaul shop, the latter representing a premature replacement every 2,292 hours.

Early Conway operating experience has been such that British airworthiness authorities have relaxed initial limitations on overhaul sampling. After a first check of samples at 700 hrs., the size of samples required of operators was reduced and the overhaul time extended to 1,000-1,100 hrs.

Three airlines—Air India, Alitalia and BOAC—are operating trial engines to 1,350 hrs. with the prospect of early approval, bringing the Conway time almost parallel to that of U.S. carriers who have had jets in operation since late '58 or early '59. A Rolls-Royce overhaul time program now approved by the British Air Registration Board will systematically carry the Conway period to 2,000 hrs.

FIRE PROTECTION

Bulletins covering safety standards proposed by the National Fire Protection Assn. are available from the association at 60 Batterymarch St., Boston 10, Mass. Following are offered: NFPA 403, Aircraft Rescue and Fire Fighting Services for Airports and Heliports, $1.00; NFPA 404, Static Electricity in Aircraft Operations and Maintenance, $.40; NFPA 407, Aircraft Fueling on the Ground, $.75; NFPA 409, Aircraft Hangars, $.75; NFPA 412, Test Procedure for Aircraft Rescue and Fire Fighting Vehicles, $.50; and NFPA 413M, Fire Hazard Properties of Aviation Fuels (Ground Handling), $.50. Booklets are dated May, 1960.

Teco Seat Design Ups Jet Capacity

TWO VERSIONS of free-form, molded plastic seat illustrate how reduced spacing would permit up to 200 "airbus" seats in 707 or DC-8 transport.

A new concept in passenger seating which will permit an airline to haul up to 200 passengers, six abreast, in a DC-8 or 707 has been devised by Teco, Inc., Burbank.

The Teco seats are new. The design is revolutionary. In fact, its originator, E. Gilbert Mason, Teco President, achieved this position largely on the strength of his "Mason Seat" design. It has been under development by Mason for three and a half years.

The clue to the design is simplicity. The seat is a molded plastic shell, with fewer than 75 parts. The average overstuffed seat has upwards of 450 parts.

The Mason Seat weighs 24 lbs. According to Teco, this is nine lbs. less than competitive models. Its great advantage is reduced size, permitting seat spacing of as little as 34 in. Teco claims passenger comfort, despite reduced spacing, equal to present day seating.

The big boost to airline economics is the hike in the number of seats possible with reduced spacing. In a high density, "airbus" seating configuration, up to 200 passengers could be carried, comparing with 106 to 112 at present, according to Teco. The company also suggests a "luxury coach" configuration with 122 seats plus six "private stateroom" places.

The "Mason Seat" is a form-fitted, molded, thermo-plastic shell of foamed-in-place sandwich structure. It is a contoured free-form shape, with 17 to 19 in. between arms. Its modular design permits complete interchangeability, allowing complete removal or repositioning in less than five minutes. The seat reclines as a single unit. Tray rests are attached underneath (see photo) and move independently.

EQUIPMENT IN BRIEF

Fire Extinguisher

A lightweight, portable fire extinguisher designed for aircraft use has been developed by Walter Kidde & Co., Aviation Div. The unit incorporates a lightweight steel cylinder and trigger-operated aluminum valve. When primed with a 2-lb. charge of carbon dioxide, the assembly weighs 6½ lbs. It is for use on class B and class C fires.

Aircraft Heater

Western Gear Corp. has produced a dual auxiliary aircraft heater designed to FAA standards. Supplying 7½ kw of heat each, the dual heaters are housed in a welded aluminum alloy structure with elements designed for 3 phase, 200 v, 400 cycle power. The amount of heating is controlled by varying the effective heater voltage.

D-C Starter

Jack & Heintz, Inc. is in production on a d-c starter designed for reciprocating engines of displacements up to 1000 cu. in. The new starter (Model 20081-000) operates on 13.5 to 24 v, has an externally adjustable clutch for protection against engine shaft damage. The jaw is automatically engaged with the engine jaw upon energization and is disengaged after the engine starts.

Towbar

A towbar which can be handled by one person has been designed by United Air Lines for DC-8, DC-6 and DC-7 aircraft. It is Y-shaped, 16 ft. long. A hand wheel which controls a turnbuckle at the aircraft end of the towbar adjusts the axle engagement pins until they are positioned into each end of the nose gear axle.

A crank at the tractor end adjusts the height of the tow-eye, then lifts the towbar wheels off the ground. The hookup can be completed in about 2½ minutes.

New 'Heat Pump' Vehicle Is First for Ground Support

Accessory Controls and Equipment Corp. has developed a self-contained "heat pump" air conditioning and heating vehicle for use with transport aircraft, in maintenance workshops or wherever temporary, portable heating or cooling is needed. It is known as Model ACE-400.

Use of the heat transfer principle—the first time this has been applied to the aircraft industry—results in the following advantages, according to ACE Corp. technicians:

- The equipment is simple, flexible, efficient, self contained, compact and vibration free.
- It can cool at a rate of 500,000 BTU per hr. from 100 deg. F to 40 deg. F.
- It can heat at the same rate from 0 deg. F to 100 deg. F.
- The unit is totally non-combustive, and can be used in vaporous areas with complete safety.

The changeover from cooling to heating is accomplished simply by reversing the procedure; the task is performed by opening two valves and closing two others and throwing a selector switch.

The ACE-400 is mounted on a standard Chevrolet truck chassis. It is also available skid mounted for either a fixed installation or for mounting on a customer-owned vehicle. The standard model has a capacity of approximately 40 tons.

Thus far two units have been constructed and are in use by Pan American at Idlewild and at Dorval Airport in Montreal. The Montreal unit is owned by Bristol Aero Industries, an organization serving several airlines at Montreal.

HEAT PUMP is shown mounted on standard Chevrolet truck chassis.

The unit is being manufactured under contract between United and the Industrial Service Co. of Oakland, Calif.

"One-man" towbar.

Coffeemaker

A compact aircraft coffeemaker and food warmer for 28-v operation has been developed by Weber Aircraft Corp. It is sized for the space now required by two standard liquid jugs and is available with one or two built-in warmer plates. The unit is known as Model CM-108, will accept sealed bags of ground fresh coffee, will also provide hot water for other purposes.

O-Ring Compound

The Parker Seal Co. is now making a new 90-durometer Viton O-Ring compound which meets specification AMS 7279. It is identified as V498-9, is a high temperature, fluid resistant, fluorocarbon type compound. Tests show the material to perform well with hydraulic fluids at temperatures up to 500 deg. F.

Jet Test Stand

A test rig to determine the rate of air leakage from jet engine sections is now available from REF Mfg. Co. Designed for JT-3 and JT-4 engines, it can be used for both static and dynamic tests, measures pressure, temperature and rate of flow. Unit requires shop air supplied at 80 to 100 psig.

Remote Throttle

A three-unit remote throttle positioning system for engine testing is being marketed by Lear, Inc. The system consists of a throttle quadrant, amplifier and servo positioner, using Lear's magnetic particle clutches for fast response and accuracy. Unit is adaptable to any test bench, offers coarse and fine adjustment, limit and idle stops and manual override.

Ice Protection

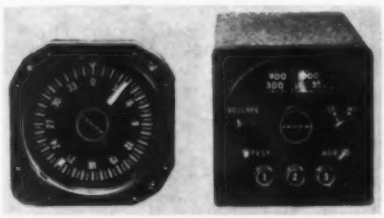
A new method of anti-icing aircraft surfaces has been developed by Electrofilm Corp. A woven mesh heating element is used to provide even distribution of relatively low surface temperatures. To counter different icing rates, the heating element can be arranged to produce various watt densities on the same part. The unit is designed to withstand separation of up to 50 percent of its conductors with little or no loss of efficiency.

ELECTRONICS

Low-Priced ADF

Tamar Electronics, Inc. has announced the addition of a new lightweight, low-priced ADF system to its Big T line of airborne products. The new unit, known as the Pres-To-Nav Model TN-1, is designed to mount in a standard 3-in. instrument hole. Controls provide for two-band tuning over the 190 to 1750 KC range, with three pre-set pushbuttons for automatic tuning to pre-selected frequencies.

Integral dial lighting is provided for each band in use. The amplifier unit with transistorized power supply is housed in a short 3/8 ATR package.

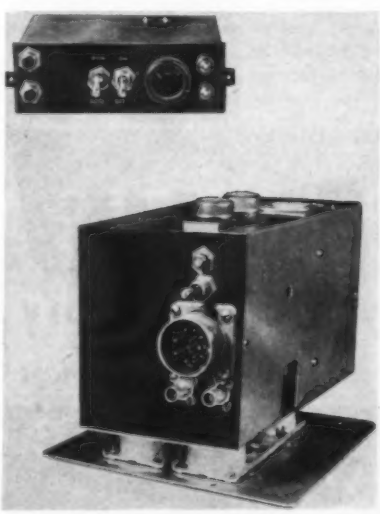


Tamar Electronics' ADF.

R-F Booster

A booster amplifier for low-power aircraft radios has been introduced by Resonant Electronics, Inc. for use with low-power aircraft transmitters (Narco VC-12, VC-27, etc.). The amplifier provides a ten times power boost, increasing the output power of these sets to five watts.

Two units comprise the system: a 1 lb. 4 oz. control unit that mounts on the instrument panel, and a 5 lb. 12 oz. power unit which is remotely mounted. No modifications of existing equipment are required. The booster operates on 14 v, draws 2 amps standby and 6 amps during transmission. Price is $395.

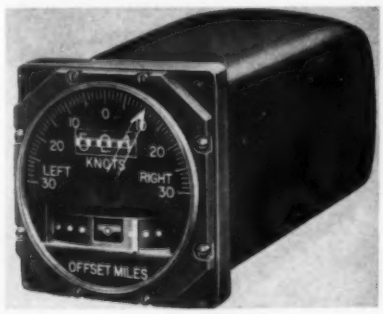


Airborne radio booster.

Doppler Indicator

A new direct doppler indicator, produced by Eclipse-Pioneer Div. of the Bendix Corp., provides a cross-track displacement display from the navigation computer in addition to the ARINC-required ground speed and drift angle displays from the doppler radar. The cross-track displacement reference on a separate course deviation indicator may be used for OMNI-RANGE navigation.

Identified as Type 37900, the unit is a companion to Type 37901, which presents only the ARINC-required ground speed and drift angle and is used when no computed information is available, or when computer information is presented on a separate instrument, such as a course indicator.



New Bendix Indicator.

For further information on items mentioned in Equipment World, write: **Readers' Service Dept., Airlift, 1001 Vermont Ave. N.W., Wash. 5, D.C.**

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Transponder Tester

Wilcox Electric Co. has announced the development of a go-no go transponder function tester for ground checkout. Designated Model 860A Portable Function Tester, the unit is hand held near the transponder antenna of an aircraft. When triggered, the signal activates the aircraft transponder which in turn lights a lamp on the tester if operation is satisfactory.

Completely portable, the transistorized unit operates from four D-cell batteries.

Wilcox transponder tester.

Electronics in Brief

Avien, Inc. has developed two-unit jet-engine time temperature recorder system weighing 5.5 lbs. which continuously displays jet engine gas temperatures and automatically monitors duration and number of deviations from normal. Unit also warns if critical temperatures are exceeded.

Leach Controls Div. has a transistorized horn warning system weighing about 1 lb. It operates on 18 to 30 v DC, has a frequency tolerance of plus or minus 10 percent at 28 v DC and 25 deg. C.

"Elastomeric" mounting systems for electronic components are offered by Lord Mfg. Co. Custom designed and integrated, they provide mounting for communications, navigation, flight control, countermeasure and fire control on a single structural base.

INFO FOR THE ASKING

Turbine fuel—Chart listing availability of turbine fuel throughout U.S. is available from Atlantic Aviation Corp., New Castle County Airport, Wilmington 99, Del.

Thermocouples—Conax offers 32-page catalog illustrating thermocouple fittings, pressure sealing glands and thermocouple accessories.

Earphones—Technical leaflet from Amplivox describes miniature magnetic earphones for use in headphones and related apparatus.

Fasteners—Uses for fasteners designed for high temperatures are detailed in catalog (No. 286) just released by Mercury Air Parts.

DAY-GLO procedures—New Switzer applicator's manual graphically describes correct procedures for applying DAY-GLO paint to aircraft.

Interior styling—Fourteen-page interior styling brochure shows Dreyfus interior designed for Lockheed JetStar, business version.

O-rings—A 12-page brochure presents the story of Tetraseals, designed for direct O-ring substitution of rings from 3/16 in. to 15 in. ID.

Tempo II—Brochure describes conversion of Douglas B-26 into executive 10-passenger transport.

Towing tractors—Bulletin (SS-1286) describes towing tractors of 22,500 and 30,000 lbs. drawbar pull, the Clarktor 225 and 300, designed for towing jet aircraft.

For further information on items mentioned in Equipment World, write: **Readers' Service Dept., Airlift Magazine, 1001 Vermont Ave. N.W., Wash. 5, D.C.**

NOTES ABOUT SUPPLIERS

• A new test stand that will permit airline operators to perform their own testing of heat exchangers and oil radiators on jet aircraft has been developed by Bendix Support Equipment, South Bend.

• AiResearch Mfg. Co. of Los Angeles is now in production on a new universal hoist with positive antifouling mechanism.

• A separate division has been set up to handle Airwork Corp. sales to prime manufacturers in the aviation and electronic industries. This division will handle sales of Bendix electrical connectors and Meletron pressure switches assembled by Airwork. OEM Division will be headquartered in Miami, under Jerry Church, Southern Division Manager.

• Campbell Aeronautical Service, Inc., which sells operations and maintenance manuals, has moved to 10700 Van Owen Street, North Hollywood, Calif. Company offers its own edition of Civil Air Regulations edited by president Robert A. Campbell, lawyer and former pilot.

• The first Canadian-built set of transmissions for the Vertol 107 twin-turbine commercial helicopter has been delivered to Vertol Div. of Boeing Airplane Co. Total of 21 assemblies have been ordered.

• Arrangements are being made to combine the activities of the de Havilland Aircraft Co. and de Havilland Propellers under a joint board in a single company known as the de Havilland Aircraft Co.

• New techniques in outdoor airport lighting have been developed by General Electric for Miami International Airport. Maurice Connell and Associates were lighting engineers for the airport. Rader and Associates designed the parking areas.

• Five airlines have received MATS contracts totaling more than $2.5 million for air transportation. Airlines are Air America, ($1,207,617); The Flying Tiger Line, ($925,810); Slick Airways. ($325,413); Seven Seas Airlines, ($55,300); and Alaska Airlines, ($11,473).

• A contract covering sale of a water-activated inflator for life vests has been granted The Garrett Corp.'s Air Cruisers Division, Belmar, N.J. by Henry Engineering Co., Burbank, Calif.

• The Republic of Indonesia will purchase all ground support equipment for Garuda, its state airline, from the Leach Corp., Compton, Calif.

• Some 35 new models of aircraft seats were developed in 1959 by Hardman Tool and Engineering Corp., Los Angeles. Twelve airlines and MATS ordered seats for 707s and 720s while eight airlines bought seats for Electras.

• An agreement for local manufacture of Marconi equipment in India has been signed by the Indian government and Marconi Wireless Telegraph, Co., Ltd.

• Air Associates, Teterboro, N.J., will join Cherry Rivet Div., Townsend Co., Santa Ana, Calif., as aircraft jobber for Cherry Rivet products.

• First of three of a new line of gas turbine-powered jet starting vehicles has been delivered to TWA by the Garrett Corp.'s AiResearch Mfg. Co., Los Angeles. It will be used on 707s at Los Angeles International Airport.

• Consolidated Diesel Electric Corp., Stamford, Conn., has added Beirut, Lebanon to the list of foreign airports that will use its Condec runway vacuum sweeper. Units already are seeing service at civil airports in Spain, Israel and Australia.

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Advertisers' Index

Allison Div., General Motors Corp. 8
Agency—Kudner Agency, Inc.

American Airlines, Inc. 4
Agency—Young & Rubicam, Inc.

Bendix Corp., The, Scintilla Div. 60
Agency—MacManus, John & Adams, Inc.

Bil-Jax, Inc. 55
Agency—Chamberlin-Junk Adv., Inc.

Boeing Airplane Co. 30, 31
Agency—Fletcher Richards, Calkins & Holden, Inc.

Braniff International Airways, Inc. 46
Agency—Potts Woodbury, Inc.

Canadair Ltd., (Sub. of General Dynamics Corp.) 14
Agency—Erwin Wasey, Ruthrauff & Ryan, Inc.

Collins Radio Co. 38
Agency—W. D. Lyon Co.

Delta Air Lines 20
Agency—Burke, Dowling Adams, Inc.

Detecto Scales, Inc. 11
Agency—J. M. Kesslinger & Assoc.

Douglas Aircraft Co. Inc. 18
Agency—J. Walter Thompson Co.

E. I. Du Pont De Nemours & Co. 44
Agency—Batten, Barton, Durstine & Osborn, Inc.

Flightex Fabrics, Inc. 56
Agency—The Powerad Co.

Goodyear Tire & Rubber Co. 3
Agency—Kudner Agency, Inc.

Lockheed Aircraft Corp. 6, 7
Agency—Foote, Cone & Belding

Northeast Airlines, Inc. 11
Agency—J. Walter Thompson Co.

Phillips Petroleum Co. 2
Agency—Lambert & Feasley, Inc.

Pratt & Whitney Aircraft Div., United Aircraft Corp. 49
Agency—Campbell-Ewald Co.

Puritan Compressed Gas Corp., Aerospace Div. 13
Agency—Richard Lane & Co.

Radio Corp. of America, Industrial Electronic Products 27
Agency—Al Paul Lefton Co., Inc.

Rolls-Royce Ltd. 42
Agency—The Wesley Assoc., Inc.

Texaco, Inc. 59
Agency—G. M. Basford Co.

Trans World Airlines, Inc. 16
Agency—Foote, Cone & Belding

Vickers, Inc. 40
Agency—Gray & Kilgore, Inc.

Warner Lewis Co. 35
Agency—Paul Locke Adv. Inc.

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Forms close three weeks preceding date of issue. Address all correspondence to Classified Advertising Department, Airlift Magazine, 1001 Vermont Ave., N.W., Washington 5, D.C.

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EN ROUTE

Clearer Signs Are Needed To Ease Counter Snafus

By Wayne W. Parrish

One of the curses of air transportation is the check-in business at airports. Sometimes it's smooth as silk. At other times it's frustrating beyond words, especially when departure time is only minutes away.

There are occasions, as everyone in the business knows, when jams at check-in counters are unavoidable. But we often wonder who in the world dreams up these counters and who decides what signs are to go up at each position.

To the uninitiated traveler, for example, what does a sign reading "Baggage" or "Baggage Only" mean at a check-in counter? We have watched passengers many times at airports to see what they do when they arrive with their baggage to check in. We have seen agents behind a position called "Baggage" stand around with nothing to do while long lines form behind other positions which are named "Tickets," although at least half the passengers in these lines are already ticketed and could be accommodated in seconds at the empty positions. But how is the occasional traveler to know that a sign reading "Baggage" means that this is a check-in position?

Why can't signs be made which spell out exactly what they are intended for? Why not "Check In Here For Today's Flights" or "Passengers With Tickets Check In Here." Be specific. Be direct. "Passengers Requiring Tickets for Today's Flights Report Here."

Of course the worst snafu at airports is the customer who is requesting reservations and tickets for flights which may be as much as three weeks ahead. How many times have passengers wanting to check in for immediate departure had to wait endlessly in a line being held up by somebody wanting information, or working out an itinerary, or buying a ticket for later that day or days later?

Some airlines have made excellent progress in smoothing out the airport tangle, simply by handling in one area the routine check-in of passengers ticketed and ready to go. Is there anything wrong with segregating passengers involved in future flights? Can't signs be flexible, so that when six flights are departing within an immediate period more positions can be opened for routine check-in, so that today's flights can be clearly marked and all other customers routed to other positions?

Seems to us that not enough progress has been made at check-in positions. It would be a good exercise for all airline executives to have to go through the routine which their customers experience regularly. They'd learn a lot and maybe the travelers would benefit. At the moment the telephone service and the check-ins at counters tend to nullify the sales effort put into costly advertising.

Old N15598

Just recently I flew on a DC-3 with over 65,000 hours of flying time on it, one of two which apparently hold the record for this famed workhorse. Both planes belong to North Central. I was on N15598 from Minneapolis to Sioux Falls to hit a new airport, Fairmont, Minn., and who do you suppose was the pilot? Nobody but personable Capt. Abe Lincoln, one of NOR's best. Nothing finer than a DC-3 flight at dusk in clear, cool autumn weather. Smooth as silk.

First Officer was Carl Mock. When I got to Sioux Falls I was met by John Orr, the airport manager, Clair Ellingson, the NOR station manager, and Chuck Simpson, the d.s.m. Before take-off at Twin Cities I bent an elbow with Bob Erdmann, NOR's manager of traffic administration, who had been on the Northwest flight from Chicago, and with D. C. Wright, public relations manager, and David E. Moran, staff assistant to Frank Buttomer, v.p.-traffic and sales.

Renewing acquaintances

Surprising how many folks I meet again as I wander around collecting new airports. When I flew to Lancaster/Palmdale the Pacific F-27 captain was Jim Douglas with whom I had flown on another airport-hunting trip quite a few years ago. And flying to Eureka, Calif., in September to hit Red Bluff, Purser Laurence Keller, seven years with Pacific, reminded me he had had me on another airport-hunting venture up the line several years ago.

Electronics, flies and a gal

Can anyone tell me why, in this age of electronics with the airlines up to their collective ears in communications gadgetry of all kinds, those cabin announcing systems always seem to work so poorly? Seems to me that only one in five is ever functioning properly.

And also in this age of chemistry and sanitation, why do so many flies find their way into an airplane cabin in the summer time? I was on a DC-7 in August and there were about two flies for every passenger and they were really pesky. Quite a nuisance. Seems to me that an insect aerosol can should be in every stewardess' kit during the summer time.

By the way, let me say that West Coast Airlines has a stewardess by the name of Jo Gloor who's a knockout, not only in looks but in voice and manner. At least that was my summary at the end of the Portland to Spokane trip when I was up there to hit Omak, Wash., the last stop to go on WCA. ■

HERMAN F. SCHEURER, v.p.-adm. and legal for West Coast Airlines, in his office in Seattle.

THREE OFFICIALS of Piedmont Airlines, snapped at the airline's Winston-Salem headquarters when WWP visited the company in August. C. Gordon Brown, Jr., v.p., Tom H. Davis, president, and Robert S. Northington, v.p.

JIM DALLAS, station mgr. for Piedmont at Shenandoah Valley Airport serving Staunton and Waynesboro, Va., left, and Sherley C. Folger, d.s.m. for Piedmont in Washington, D.C. Photo taken in August.

WHILE PICKING up new airports on West Coast Airlines in August, super-lush hospitality was provided at Portland, Ore., between flights by L. W. "Rusty" Rostad, d.s.m., left; Jane Unger, 7-year WCA veteran who is now district sales reservations manager, and Harold G. "Bud" Scull, station manager who has been with WCA since it started. A tour of Portland's fabulous new Lloyd Center and excellent lunch at the Pantry, featured the painless stopover. Portland's handsome terminal is in background. Photos by WWP.

BUSINESSMEN ARE READING THIS VITAL NEWS ABOUT LOCAL SERVICE AIRLINES

They're reading it in *Business Week*. In succeeding months, they'll be reading more about how Local Service Airlines are contributing to America's growth.

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NEWS OF LOCAL SERVICE AIRLINES

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CIVIC PLANNERS FIND NEW WAY TO ATTRACT TOURISTS

Civic and business leaders of Fort Walton Beach, Fla., find it pays to personally advertise their annual Pirate Spring Festival.

Before the Festival starts, these men visit 15 to 20 cities in the vicihity by chartered Southern Airways planes. They invite everyone they see to come on down and join in the fun.

Other community boosters find this same word-of-mouth method effective in bringing in new business and permanent residents.

* * *

INDUSTRIAL LOCATION NO LONGER DEPENDENT ON FIXED TRANSPORTATION

Thanks to flexible, dependable local airline service, it is now possible for almost any community to establish the transportation facilities needed to attract industry.

Take the area around the Great Lakes covered by Lake Central Airlines. Among the giant industries which have moved into this area are six Westinghouse plants, six RCA plants, and nine General Electric subsidiaries.

Because fixed costs are lower and living conditions more pleasant, industrial planners find these moves to less congested areas profitable, too.

* * *

FLIGHT FREQUENCY BRINGS NEW LIFE TO SMALLER CITIES

Local airline flights offer the businessman or all-day shopper "go-and-return" service between small cities and their metropolitan neighbors. Flights are scheduled to allow travelers to conduct a full day's business and be back home for dinner with the family.

For example, North Central Airlines schedules 53 daily flights between Milwaukee and Chicago; 20 between Detroit and Chicago; four daily nonstops between Duluth and Chicago; and 16 flights between Milwaukee and Green Bay, Wisconsin.

Progressive towns use this flight frequency to plan future growth and to attract new industrial development to the intermediate-size city.

* * *

HOW LOCAL AIRLINE AIDS COMMUNITY GROWTH

Frontier Airlines has drastically stepped-up its service to meet the growing needs of Farmington, N. M. — which has had a recent 500% population jump because of local discoveries of oil, gas, and uranium.

Twelve daily flights bring in everything from oil field rigging equipment to flowers. Cargo pits and doors have even been changed to accommodate over-size items.

Accommodating service like this is typical of local airlines everywhere. More than 300 cities now use local service airlines as their *only* means of air transport.

* * *

SPECIAL AIRLIFT BOOSTS CARNIVAL ATTENDANCE

Caribair airlifted nearly 6,000 sightseers to the 5-day St. Thomas Carnival in Puerto Rico this spring. 216 round-trip flights did the job. Nearly 90% were scheduled during the 3-day peak period.

Because local service airlines are uniquely equipped to transport rapidly a few dozen or several thousand people on short notice, conventions, meetings, and other special events can now be held almost anywhere.

* * *

LOCAL CARRIERS OFFER UNIQUE ADVANTAGES

Passenger volume on local service airlines has increased *five times* since 1950. The many unique advantages offered by these airlines are a big reason why. Here are just two!

Aloha Airlines has converted almost completely to Rolls-Royce powered F-27 high-wing Jetprops giving passengers an unmatched view of the scenic beauty of the Hawaiian Islands. Aloha's Jetprop fleet is supplemented by DC-3 "Vistaliners" with 5-foot "flight-seeing" windows, as well as special lens ports for undistorted photography.

To help passengers get around the big Southwest faster, Bonanza Airlines has now converted almost completely to pressurized, air-conditioned F-27 Silver Dart Jetprops.

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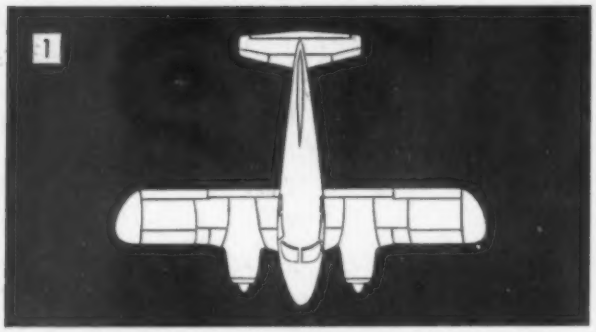

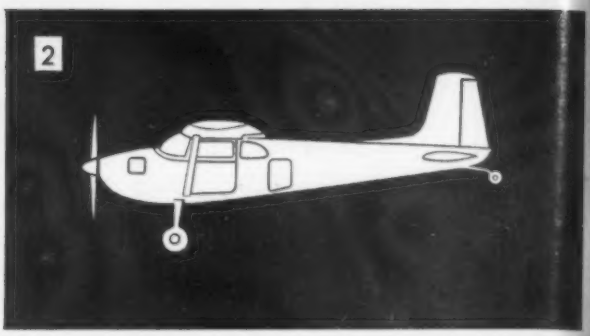

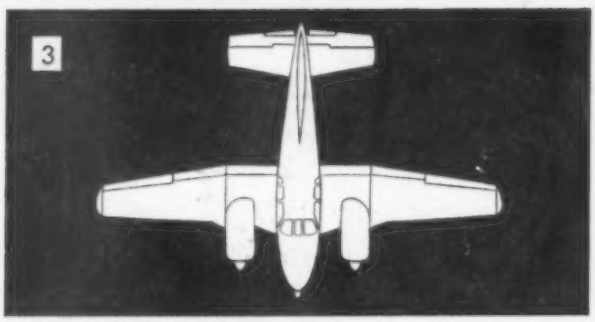

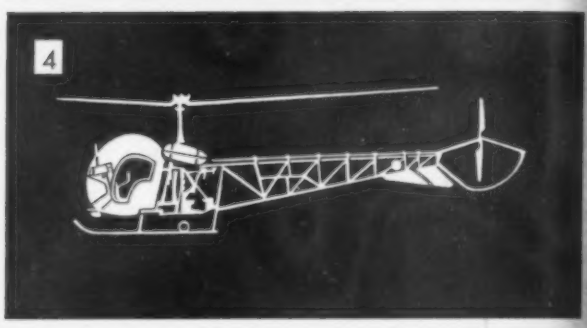

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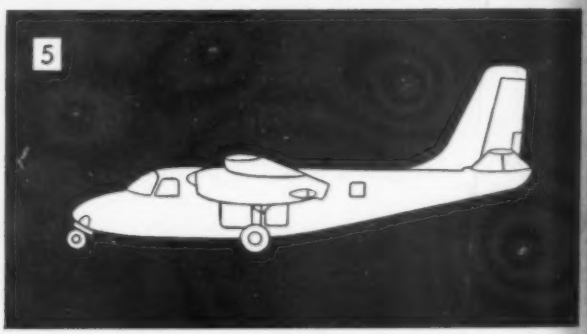
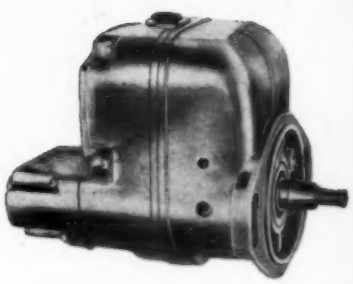


Although differing in appearance,
they all have one thing in common . . .

NEW BENDIX S-200 MAGNETOS



Here's a completely new, widely acclaimed ignition unit that provides superior performance and improved starting so necessary for today's 4- and 6-cylinder business aircraft.

In the Bendix® S-200 magneto, a great new design concept eliminates the mechanical impulse coupling. Replacing it, a retard breaker and battery-operated vibrator produce a "shower of sparks" at the spark plug through high voltage induction in the magneto's secondary. A combination ignition-starting switch automatically controls starting and operation of retard breaker, magneto and booster. The S-200 magneto is typical of Bendix capabilities in delivering superior ignition equipment, including magneto systems for aircraft of all types and sizes. Write today for complete information on the S-200 magneto or other ignition needs.

Pictured above: 1. Piper Aztec 2. Cessna 180 3. Beechcraft Twin Bonanza 4. Bell 47-G2 Helicopter 5. Aero Design—Model 500

Scintilla Division
SIDNEY, NEW YORK

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